EA-87-02

Ontario

ENVIRONMENTAL ASSESSMENT BOARD

VOLUME: 208

DATE: Wednesday, May 30, 1990

BEFORE:

A. KOVEN, Chairman

E. MARTEL, Member

FOR HEARING UPDATES CALL (TOLL-FREE): 1-800-387-8810

EARR & ASSOCIATES REPORTING INC.

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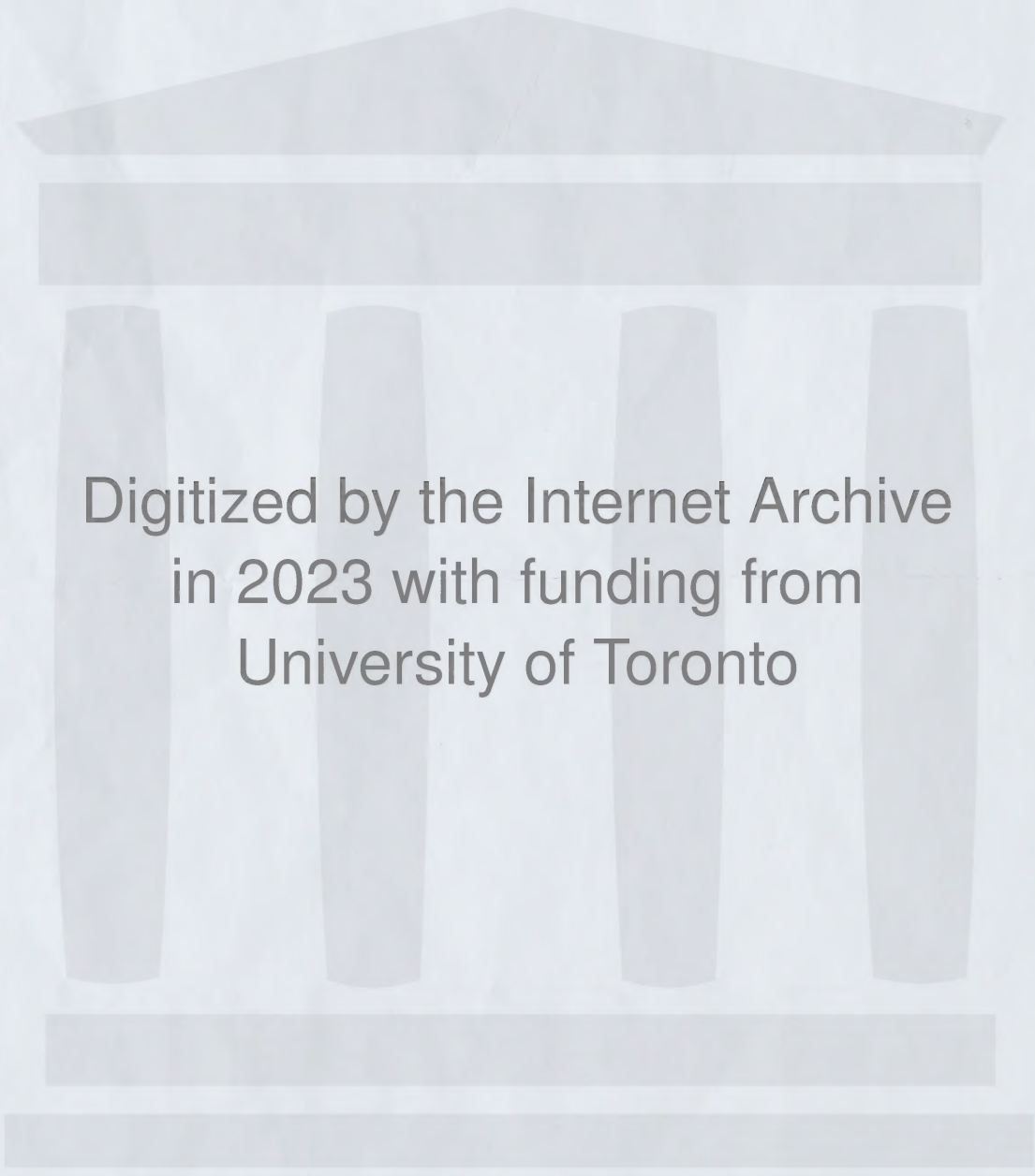

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HEARING ON THE PROPOSAL BY THE MINISTRY OF NATURAL RESOURCES FOR A CLASS ENVIRONMENTAL ASSESSMENT FOR TIMBER MANAGEMENT ON CROWN LANDS IN ONTARIO

IN THE MATTER of the Environmental Assessment Act, R.S.O. 1980, c.140;

- and -

IN THE MATTER of the Class Environmental Assessment for Timber Management on Crown Lands in Ontario;

- and -

IN THE MATTER OF a Notice by the Honourable Jim Bradley, Minister of the Environment, requiring the Environmental Assessment Board to hold a hearing with respect to a Class Environmental Assessment (No. NR-AA-30) of an undertaking by the Ministry of Natural Resources for the activity of timber management on Crown Lands in Ontario.

Hearing held at the offices of the Ontario Highway Transport Commission, Britannica Building, 151 Bloor Street West, 10th Floor, Toronto, Ontario, on Wednesday, May 30th, 1990, commencing at 8:30 a.m.

VOLUME 208

BEFORE:

MRS. ANNE KOVEN	Chairman
MR. ELIE MARTEL	Member

A P P E A R A N C E S

MR. V. FREIDIN, Q.C.) MS. C. BLASTORAH) MS. K. MURPHY) MS. Y. HERSCHER)	MINISTRY OF NATURAL RESOURCES
MR. B. CAMPBELL) MS. J. SEABORN) MS. B. HARVIE)	MINISTRY OF ENVIRONMENT
MR. R. TUER, Q.C.) MR. R. COSMAN) MS. E. CRONK) MR. P.R. CASSIDY)	ONTARIO FOREST INDUSTRIES ASSOCIATION and ONTARIO LUMBER MANUFACTURERS' ASSOCIATION
MR. H. TURKSTRA	ENVIRONMENTAL ASSESSMENT BOARD
MR. E. HANNA) DR. T. QUINNEY)	ONTARIO FEDERATION OF ANGLERS & HUNTERS
MR. D. HUNTER) MS. N. KLEER)	NISHNAWBE-ASKI NATION and WINDIGO TRIBAL COUNCIL
MR. J.F. CASTRILLI) MS. M. SWENARCHUK) MR. R. LINDGREN)	FORESTS FOR TOMORROW
MR. P. SANFORD) MS. L. NICHOLLS) MR. D. WOOD)	KIMBERLY-CLARK OF CANADA LIMITED and SPRUCE FALLS POWER & PAPER COMPANY
MR. D. MacDONALD	ONTARIO FEDERATION OF LABOUR
MR. R. COTTON	BOISE CASCADE OF CANADA LTD.
MR. Y. GERVAIS) MR. R. BARNES)	ONTARIO TRAPPERS ASSOCIATION
MR. R. EDWARDS) MR. B. McKERCHER)	NORTHERN ONTARIO TOURIST OUTFITTERS ASSOCIATION

APPEARANCES: (Cont'd)

MR. L. GREENSPOON) MS. B. LLOYD)	NORTHWATCH
MR. J.W. ERICKSON, Q.C.) MR. B. BABCOCK)	RED LAKE-EAR FALLS JOINT MUNICIPAL COMMITTEE
MR. D. SCOTT) MR. J.S. TAYLOR)	NORTHWESTERN ONTARIO ASSOCIATED CHAMBERS OF COMMERCE
MR. J.W. HARBELL) MR. S.M. MAKUCH)	GREAT LAKES FOREST
MR. J. EBBS	ONTARIO PROFESSIONAL FORESTERS ASSOCIATION
MR. D. KING	VENTURE TOURISM ASSOCIATION OF ONTARIO
MR. D. COLBORNE) MS. S.V. BAIR-MUIRHEAD)	GRAND COUNCIL TREATY #3
MR. R. REILLY	ONTARIO METIS & ABORIGINAL ASSOCIATION
MR. H. GRAHAM	CANADIAN INSTITUTE OF FORESTRY (CENTRAL ONTARIO SECTION)
MR. G.J. KINLIN	DEPARTMENT OF JUSTICE
MR. S.J. STEPINAC	MINISTRY OF NORTHERN DEVELOPMENT & MINES
MR. M. COATES	ONTARIO FORESTRY ASSOCIATION
MR. P. ODORIZZI	BEARDMORE-LAKE NIPIGON WATCHDOG SOCIETY

APPEARANCES: (Cont'd)

MR. R.L. AXFORD	CANADIAN ASSOCIATION OF SINGLE INDUSTRY TOWNS
MR. M.O. EDWARDS	FORT FRANCES CHAMBER OF COMMERCE
MR. P.D. McCUTCHEON	GEORGE NIXON
MR. C. BRUNETTA	NORTHWESTERN ONTARIO TOURISM ASSOCIATION

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---Upon commencing at 9:00 a.m.

MADAM CHAIR: Please be seated.

MAXWELL McCORMACK,
RODERICK CARROW,
ROBERT TOMCHICK,
WILLIAM SMITH,
MURRAY FERGUSON,
PHILIP BUNCE,
GEORGE STANCLIK, Resumed

MADAM CHAIR: Dr. McCormack, would you like to...

DR. McCORMACK: Yes. Madam Chair, Mr. Martel, I have the answer to your question of Monday afternoon concerning the spraying in Minnesota which was raised.

I talked with a colleague in Minnesota and then with a Mr. Michael Phillips with the Minnesota Department of Natural Resources who has been directly involved in all the discussions regarding herbicide spray activity in the State of Minnesota and, in summary, there has been a voluntary suspension of spraying by the USDA Forest Service on the national forest lands of Michigan, Minnesota and Wisconsin for a five-year period. So that would be the federal/national forest lands in that case.

They did this with the intention of monitoring conditions, evaluating alternatives and writing of environmental impact statements, a rather

lengthy, expensive procedure which in the United States is one way they address these matters, especially on the federal lands.

Now they are faced with budgetary limitations that they cannot carry this out, so that is in some not described suspended state until they can decide what they are going to do with the understanding that the clock is running on this five-year suspension.

Regarding state lands, the Minnesota Department of National Resources entered into a mediation process with a number of groups concerned about herbicide spraying, they carried that out, reached some agreements in part which will provide some funding for research and development.

The end result is, there has been no suspension of herbicide spraying, however, the tate has agreed to reach a cap; in other words, a maximum area to be sprayed aerially on state-owned lands only of 3,500 acres. Their current plans, for your information, for the coming year were to aerially spray 2,000 acres.

Counties and county lands can spray as they wish and there are some very active spray programs in the counties. There are no restrictions whatsoever on private industry in what they do on their lands, so

anything that is available within the federal regulations is available to private industry in the State of Minnesota.

Just a couple of other comments regarding the federal lands that I learned at the latter part of my conversation with Mr. Phillips. On the federal lands there are some exceptions, that they can spray as needed on utilities' rights-of-ways and similar situations where safety or road maintenance is a concern, and there have been no suspensions or restrictions whatsoever on insecticide spraying, just for your information.

I have an office telephone number for Mr. Phillips which I would rather not put in the record but, if you like, I can make it available to the Board and he is available if you wish to pursue this further.

MADAM CHAIR: Thank you, Dr. McCormack. We won't be pursuing it with Mr. Phillips, but thank you.

Two quick questions. The State has agreed to a cap of 3,500 acres annually?

DR. McCORMACK: Annually, yes, I'm sorry, I should have specified that as per year aerial application.

MADAM CHAIR: Of herbicides. Can you

tell me, in Minnesota, are federal lands a large proportion of the land base?

DR. McCORMACK: I don't know.

MADAM CHAIR: And state lands, is it the situation that we have in Ontario where...

DR. McCORMACK: There are portions of two national forests in the State of Minnesota. What the total land area is, I don't know. I have the impression, in talking with the state people, that the state lands which are managed for timber production are not large areas and I judge that from the maximum acreage that I'm aware of that they have sprayed aerially in a given year in the past is approximately 6,000 acres.

MR. HANNA: That was state lands?

DR. McCORMACK: That's state lands, yes. State-owned lands managed for timber production. It may be in combination with other uses as well, but where there is timber production objectives on those state lands.

MADAM CHAIR: Thank you, very much, Dr. McCormack.

Mr. Hanna?

CONTINUED CROSS-EXAMINATION BY MR. HANNA:

Q. Dr. McCormack, I would like to follow

up on one point which we discussed at the end of yesterday, and that is with respect to cost effectiveness.

I believe we agreed that cost effectiveness requires that a clear objective or end point has already been decided and cost effectiveness is a means to evaluate various options to achieve that alternative; is that a fair summary of what --

DR. McCORMACK: A. I agree.

Q. I wish to ensure that we are of the same understanding with respect to what is meant by a clear objective or end point.

When I asked you the questions I intended it to mean a specific forest structure that might be defined according to various characteristics such as species composition, spacial pattern of stand or a group of stands, stocking, et cetera.

Is this what you understood, when you answered the question, by a clear end point having been decided?

A. Yes, Mr. Hanna, as I understand your description, that would be one way to specify or describe an objective.

Q. Would you agree that such objectives should be defined over a time horizon and not just for

a specific point in time; for example, a rotation of the forest?

A. With a dynamic system like the forest I think one must always consider beyond a single point.

Q. That's a yes? I'm not being trivial here, I just wanted to make sure that it's agreeable to you.

A. It's a yes.

Q. While the forest produces many benefits, the forest structure in terms of the sort of factors I have talked about, the stocking, species composition, spacial distribution of stands, is a key determinant to realizing many of these benefits; is it not?

A. This description certainly relates many benefits, but I must emphasize, the focus of this panel is on timber production.

Q. I appreciate that, and I certainly am overly conscious of that. I guess the point that I'm saying is: Accepting that to be the fact the point is: That forest structure is not only important for timber production, it's important for virtually all the benefits that we receive from the forest land base?

A. Yes. Oh yes.

Q. Now, yesterday I talked to you about

this matter of the fact that we have to somehow decide on what that end point is we want to achieve. I just want to ask you one question on that and, that is, in arriving at the selected end point, would you agree that one must examine the feasible forest structures possible or, as Dr. Baskerville calls them, the production possibilities and make a choice as to the preferred structure, that's the process you would go through to get to that end point?

A. I guess, Mr. Hanna, I'm concerned here that where one gets involved in decisions regarding this process that that becomes part of the planning process, and I'm not in a position to discuss that.

Q. You would agree that there is, in virtually every case though, a range of feasible forest structures that we might achieve through various timber management activities including tending; there's not one choice, there is often a range of choices that we can achieve in terms of the forest structure?

A. There are many structures and there is also a constant change in any of those structures.

Q. Some of those changes we can control and some of them we can't control?

A. We can modify them within the laws of

nature.

Q. Mr. Stanclik, I would like to ask you some questions on Section 4.5 which starts on page 99 of the witness statement. This is the section dealing with the type and extent of the use of herbicides by the Industry in the area of the undertaking; correct?

MR. STANCLIK: A. Yes.

Q. I would like, first of all, if you could briefly list for me the major factors that you're aware of that influences the extent of herbicide use by the Industry in the area of the undertaking?

A. The major factors that list the extent of the use?

Q. Yes. Well, perhaps I can just - just to expedite this - I will ask you some factors and you can answer whether or not you feel they affect the extent of use?

A. Very well.

Q. The available funds?

A. That I don't think is -- are you talking specifically one type of tending or are you talking all tending?

Q. Well, I'm talking about herbicide use and relative to the fact that you're making a choice in terms of tending, you've got a series of tending

options, and one of them being herbicide use, and I'm focussing particularly on herbicide use and the factors that affect the extent of herbicide use, particularly aerial sprays of herbicide, in the area of the undertaking for tending?

A. Funds available is a consideration but not one of the prime ones.

Q. And why do you say that?

A. Because things like efficacy and labour, equipment available and climatic conditions and things like that are other factors that are considered.

Q. But those don't even get considered if you haven't got the funds?

A. Well, you're talking about extremely limited funds, then I suppose that's correct.

Q. Right. And if we have limited funds and we have different techniques, some being more cost effective than others, then funds can be very important in determining which ones if we have a certain objective in terms of an area to be treated; is that not fair?

A. Yes, that would be fair to say.

Q. Another rather perhaps obvious thing, but another factor affecting the extent of herbicide use is the area requiring tending, the extent of the

area, accessibility, size of the area and the size of the blocks, those sorts of things; is that correct?

A. Yes.

Q. Would another factor - and perhaps you have included this in your efficacy factor - be what is termed expected rate of return on investment; in other words, some idea in terms of payback, in terms of the amount of funds invested versus the benefit that you expect to realize?

A. Yes.

Q. And of course rolled into that is the cost of treatment, that's part of one of the factors you consider in that?

A. Cost of the tending treatment and the cost of any previous treatments that have been carried out.

Q. And I think also in efficacy you would call, what I would say, effectiveness; in other words, how effective it would be in achieving your end? In other words, how many more times you might have to invest as opposed to once. You'd agree?

A. Yes, yes.

Q. Now, it's my understanding that tending operations are included within the terms of FMAs and that the Industry is reimbursed at a fixed

rate for these activities; is that correct?

A. A fixed rate based on negotiated rates per FMA. The rates will vary across the provinces, FMAs, and the method of application.

Q. So in the case of aerial spraying the return might be less than -- or the reimbursed rate might be less than if it was manually applied?

A. Yes.

Q. Does the current level of funding restrict the amount of tending that is preferred to be carried out in the area of the undertaking?

A. My understanding is that in my own situation we have been restricted initially in 1989 as to how much we were permitted to tend, but later on in the year funds became available and we were able to carry out most of our program.

Q. So if I was to have said to you at the beginning of 1989 - and I respect you're just speaking specifically with respect to your company; is that correct?

A. Yes, that's correct.

Q. If I was to say to you at the beginning of 1989, here's that pot of gold at the end of the rainbow, you would have taken out much more than what you used in '89 to achieve your objectives in that

year?

A. Could you repeat that again, please?

Q. I'm saying to you, if you had have had unlimited funds--

A. Yes.

Q. --in 1989, the level of tending that your particular company would have undertaken would have been materially no different?

A. That's correct, considering that we were initially cut back and then we were able to carry out the program we had originally proposed, would have then been materially the same.

Q. Who shall I ask in terms of getting an idea for the Industry more broadly than just your company. Is there a member of the panel which will speak to that, or you shall I ask each panel member individually? I am interested in finding out what sort of constraints there currently are in the Industry?

A. I think you should ask each OFIA member individually.

Q. Mr. Smith, you're next in the line. I'm interested with your particular case what proportion of the area within your FMA lands did you treat -- did you apply tending treatments and how much was not treated that you would have liked to have

treated?

MS. CRONK: When?

MR. HANNA: Q. We'll start in 1989.

MR. SMITH: A. Okay. If we are to look at the total productive area within the Spruce River Forest FMA of being 598,946 hectares --

Q. Slowly, I can't write that quickly.

A. 598,946. We would be spraying approximately an area of about 3,000 hectares. Unfortunately, I'm going to need a calculator to put that into a percentage.

MR. HANNA: Last time I came I forgot --

DR. CARROW: He's got one.

MR. SMITH: That's roughly half of one per cent.

MR. HANNA: Q. Okay. So you sprayed half of one per cent. The question is: Is that the total area that your company would have liked to have tended; in other words, if I had given you said -- here's another -- let's say I gave you another half a million dollars and said: You can use this for tending in any way you like, would you have used it; would you have said no, government, take it back?

A. The program in 1989 was, in my estimation, sufficient; in other words, it would not

have increased beyond that total.

Q. What was your -- or perhaps I'll ask this first. The 3,000 hectares that you did spray, when was that harvested?

A. It was harvested over a period of time, a number of harvesting seasons and...

Q. How far back would it go two, three years?

A. It could have gone back--

Q. Four years?

A. --even beyond four or five years. I would anticipate that since the 1981-82 time frame when we signed our forest management agreement and started planting trees, I would suspect that the majority of that tending program was directed to those plantations.

And I would like to qualify that by saying that the spraying was done only on those plantations that required the treatment.

Q. Yes, I expect you wouldn't do it on somewhere that didn't require the treatment. I'm not quite certain of why you want to add that qualification; like, is there other places that you might have sprayed that you didn't spray?

A. No, definitely not. I qualified that simply to put the numbers in perspective.

Q. And what is the annual area that's harvested on your FMA on the average?

A. I would have to, rather than -- what I would prefer to do rather than simply giving a number out of the air would be to, if you are requesting, I can get that information.

Q. Sure. I would be just interested just as an average area that you harvested, just put some perspective to that number. So if that's easy for you to provide, I would appreciate it.

A. Okay.

MR. HANNA: Madam Chair, can we have an undertaking?

MADAM CHAIR: Yes, Mr. Smith has undertaken to do that.

MR. HANNA: Q. And, Mr. Smith, you would expect this 3,000 hectares to be a reasonable average that you would expect to continue indefinitely in the future based upon your current understanding of that FMA?

MR. SMITH: A. We feel quite confident that that level of tending activity will more or less remain consistent, certainly in the foreseeable future.

Q. Of that 3,000 hectares, do you have any idea what proportion had received a second

treatment?

A. I would - and I may have to qualify this by providing you with some additional information - but if you were looking for a figure, less than one per cent.

Q. That's adequate. If you feel reasonably competent in that, that it isn't more than 10 per cent, that's adequate for my purposes.

Mr. Bunce, can we talk the experience with your company's lands. In 1989 if you had had -- well, first of all, what area approximately was sprayed on your FMA lands?

MR. BUNCE: A. Well, you're talking about three FMAs and for me to quote you the exact figure, I don't think I have it at this time. However, we are probably looking, if you put all three together - and I'm talking very generally here - maybe 6,000 hectares. That's total tending as well including aerial and ground floor tending.

Q. Do you have a ballpark number for the total area of those three FMAs?

A. I think I gave the ballpark figure yesterday and I didn't -- but I do have it here. I think it was in the order of something like 1.3-million hectares. Would that -- if you would like me to find

it...

Q. Rounding it off, I don't need it to .946, the nearest thousand is certainly adequate.

A. 1.3-million hectares of productive forest land in the total area.

Q. That's fine. Now, if I was to say to you there were additional funds available for tending within that 1.3-million hectares, is there a reasonable way that it would be used at the present time according to your knowledge of the lands?

A. As Mr. Stanclik stated, at the initial part of last year's program there was some question as to the amount of funding available, however, we carried out the program that we had hoped with the exception that at the end of the year we got cut a little short because of the weather. So we may not have completed the last small portion due to weather, not due to funding.

And if I had any more funding, I don't think I would have managed my FMA any differently than I did and it was. In other words, the areas that I felt required tending in that year were tended, with the exception of the small portion that was not tended due to the frost at the end of the year.

Q. So instead of 6,000 hectares it might

have been another hundred, 200?

A. As I say, if you would like the exact figure. I didn't say it was 6,000.

Q. No, I'm sorry, I'm not trying to pin you down on the 6,000, I'm just trying to get an idea of the amount that you were cut short due to the weather?

A. Well, there's probably 700 hectares we didn't get done because of the weather.

Q. Have you experienced in the past budgetary constraints in terms of the amount of funds available for herbicide tending; the past being from when your FMA was signed, the 81-82, in that period?

A. 1980 the FMA was signed. I cannot recall at any point in time since 1980 that we have not received a subsidy rate for tending on the FMAs.

Q. And the tending that you have undertaken on your FMA, has it been over that period generally in the order of 6,000 hectares?

A. No, I would have to say that it started quite small, basically because we started out - I think some of this was mentioned earlier by Mr. Stanclik - when you start the FMA it takes a while for our plantations to get -- so it has grown from that time to approximately the area that we have now.

Q. But you're now at a mature state, if I can use that term, in terms of the program's full underway and you are now treating the lands that you feel need to be treated?

A. Yes, I would say we are at that point now.

Q. And this is a number that we can expect to continue for the foreseeable future?

A. Well it is, but I can't say that it's going to remain exactly at that. It definitely depends on the sites that happen to be treated several years before and certain areas you may treat -- you may harvest different sites or proportions of sites that have different competition factors on them.

So it may vary somewhat, but I don't expect it to be 12,000 and I don't expect it to be 2,000, you know, I expect it to be in that range, yes.

Q. And on the 6,000 hectares that you referred to, approximately, on what proportion of the area was glyphosate used?

A. I couldn't give you the exact portion, however, we do -- I would say probably last year was in the order of 60 per cent glyphosate and approximately 40 per cent 2,4-D.

Q. Mr. Smith, I inadvertently didn't ask

you that question. Of the 3,000 hectares that you made reference to, what proportion was glyphosate?

MR. SMITH: A. In 1989?

Q. Yes.

A. I believe it to be one hundred per cent.

Q. I really don't want to belabour this around the table. Is it possible for me to canvass the other members of the panel, and the key thing I'm interested in is whether or not at the present time you see constraints in terms of the area tended due to budgetary limitations in 1989.

Does any of the members of the panel wish to suggest otherwise to what these three gentlemen have told me so far?

I'm not suggesting you contradict your panel members, it may be that your particular FMA may be different than these three gentlemen have told us, so I offer you that opportunity.

MS. CRONK: No. The difficulty with that, Madam Chair, is we've had three different answers based on the experience of three different individuals, and if the question is: What constraints, if any, applied in 1989, I think Mr. Hanna has to put it to the remaining witnesses. We've had a variety of answeres'

given.

MR. HANNA: Madam Chair, I heard the answers from all three of these witnesses saying that while there was a constraint in terms of budget at some point in 1989 that was lifted and other constraints may have limited the area tended, but it was not budgetary constraints that limited the area tended. That's the --

MS. CRONK: Sorry, that's not what the evidence has been. My friend can take in the end what he wishes from what he has heard, that's not what I heard. I don't mean to be difficult, but he's got the witnesses here, I think you should put your questions to them and find out.

MADAM CHAIR: I think, Mr. Hanna, it would be best to finish off the panel right now.

MR. HANNA: Q. Mr. Ferguson?

MR. FERGUSON: A. Budgetary constraints?

Q. Well, let's first find out about the size of your FMA and the area sprayed in '89.

MR. FERGUSON: A. Okay. The size of the FMA in the English River Forest which I am responsible has a total area of 626,597 hectares of which 462,314 hectares is productive forest land.

Q. That was 4...?

A. 462,314.

Q. Okay. And the area chemically treated for tending in 1989, approximately?

A. In 1989 there was no tending treatments conducted on the English River Forest.

Q. Have you had chemical tending on that FMA since the FMA was signed?

A. Yes, we have.

Q. What's the average area of chemical tending that's taken place since that FMA was signed, approximately?

A. It is low, in fact since the inception of the English River FMA there had been tending treatments conducted -- chemical tending treatments conducted in three years of the, I guess we're into the tenth now. That has varied. I would say the average over the 10 years would be in the order of possibly 500 hectares per year.

Q. And the reason for this is, you have a very sandy, dry FMA in many of the places you cut and, therefore, you don't need -- you don't have the competition at the same level?

A. That's correct, the competition is not a major problem on the English River Forest.

Q. And I take it then that budgetary

constraints have not been a concern in terms of the area chemically treated on your FMA?

A. That's correct. Anything we have deemed to be necessary to be tended, the funding has been available to tend.

Q. Mr. Tomchick?

MR. TOMCHICK: A. I don't have the exact numbers for our three FMAs. I can give you approximations.

Q. I'm not dealing with the exact details, I'm trying to get a general feeling for what's influencing the level and intensity of treatment in the area of the undertaking. So I'm quite willing to live with your best approximation, unless you feel really uncomfortable.

A. Total area of our FMAs approaches seven to 800,000 hectares. Our tending program in 1989 was in the order of four to 5,000 hectares, and I'm not sure about that number, but it's in that range, four to 5,000 hectares.

In 1989 we were initially advised by the Ministry of Natural Resources that there was a possibility of a funding constraint; however, as in the case of Abitibi, that funding constraint was lifted later in the year and we were able to tend all the

areas that we had initially planned to tend.

So given our current tending objectives and our current groundrules, we have been able to tend the areas that we felt necessary to tend.

The current level of tending I would not expect to change significantly one way or the other, given the current objectives and guidelines and policy.

Q. Objectives I understood, I didn't understand how guidelines and policy would affect the area tended. Could you just elaborate on that for me, please?

A. In terms of our tending objective which is stated in our groundrules, that's what I meant by a guideline.

Q. And that's what you meant also by policy?

A. Yes.

Q. And so your evidence is that this level of tending that you have suggested in the order of four to 5,000 hectares is what you would expect for the foreseeable future, with the same provision that Mr. Bunce has given us, that there will be some variation from year to year, but we're talking plus or minus 10 per cent type of variation?

A. I wouldn't want to put a number on

it, but we could expect the level to remain generally the same.

Q. And just for completeness, the type of herbicide that you have used for that four to 5,000 hectares?

A. Again, this is an estimate of roughly 70 per cent glyphosate, 30 per cent 2,4-D.

Q. Mr. Stanclik, I come back to you beofore I started on this. You have now heard the answers from these other panel members. Seeing that you are responding to Section 4.5, I'm going to ask you: Do you feel this is reasonably representative of the situation across the Industry, the kind of answers we've heard?

MR. STANCLIK: A. I don't know if it represents all the FMAs, all I can comment on is what I heard here today from these five FMAs.

Q. Mr. Stanclik, have the funds available for tending been increasing since 1982?

A. In what sense do you mean?

Q. As the total dollars available for tending changed in any way since 1982?

A. There has been more tending proposed by the FMAs as the renewal program in our province has grown and as the number of FMAs has increased, and also

there has been changes in the FMA rates incremented by the rate of inflation. So, yes, there have been -- there are more funds spent on tending now than in 1980 by FMAs.

Q. But coming back to this same issue, that you said that because your regeneration program has developed and matured your view is it's basically reached a plateau at this point, that regeneration program?

A. At this time most FMAs are close to being fully implemented and based on that fact and the fact that most companies are catching up on their backlogged areas, it is not expected that the scale of tending programs will increase much in the future.

If the province on the other hand decides to expand its renewal program, you can anticipate there will be a corresponding increase in the amount of tending that is done.

Q. Perhaps you can just explain to me what the relationship is there between the province's renewal program and the prescriptions that you develop in a timber management plan on an FMU? What's the connection between those two, I don't follow the connection?

A. In the past not all hectares were

being regenerated and, therefore, with the expansion of the program there is more area being treated which in turn requires protection.

Q. So there's more areas being planted?

A. More areas being planted, yes.

Q. Yes. I just wanted - when you mean treated, that's what you mean by treated?

A. Treated, yes.

MR. MARTEL: Are you talking only Crown management units, or...

MR. STANCLIK: I am talking FMAs only.

MR. MARTEL: Mr. Hanna said Crown management units, I think that is what I heard you say.

MR. HANNA: I'm sorry, that was inadvertent, Mr. Martel. I understand that these gentlemen are really speaking on --

MR. MARTEL: Yes, that's why I asked the question.

MR. HANNA: --forest management units. Sorry, I'm speaking of FMA lands.

Q. You're saying there's more areas being treated and, hence, more areas requiring tending; is that correct?

MR. STANCLIK: A. That's correct.

Q. And I gather what you're saying then

is that the key factor controlling the area tended is the area being treated; is that what I'm hearing you say?

A. Well, usually renewal treatments have different components, tending being one of them, or may be one of them; and, yes, when you treat an area intensively you want to protect your investment and, therefore, you may tend.

Q. Now, two things arise out of that; one, are you saying to me then that areas that are not planted or otherwise intensively managed are generally not aerial sprayed?

A. No, I'm not saying that. Areas that may be left for natural regeneration may also require a tending treatment at some point.

Q. I'm trying to come around this. See, you've told me that there's this connection between the renewal program and the area tended, and I'm trying to understand if the answers that this panel has given me in terms of the area tended is premised on the current renewal program; is that correct?

A. Yes.

Q. And so if the province was to say we want to expand the renewal program, then that in turn would lead to a larger area being tended; is that

correct?

A. Yes, it may.

Q. So that the driving factor in terms of the area tended is the renewal program?

A. The extent of an intensive renewal program.

Q. And natural regeneration, is that part of intensive renewal?

A. No, that is extensive usually.

Q. But you would still treat those with herbicides in some cases?

A. If it was required, yes. Maybe I can help you, Mr. Hanna. On very productive sites, if you do not treat it intensively the working group may change.

Now, we are trying to maintain the working group that was there originally, therefore, we treat it intensively, and to protect our investment we tend.

Q. But with natural regeneration the investment can be much lower than if you planted it?

A. Yes, yes, but you may get a change in the working group on very productive sites.

Q. And you may want to change the working group on very productive sites?

A. That's true too, you may want to change the working group.

Q. Now, as far as backlogged areas, is it your understanding that to a large extent, at least on FMA lands, that much of the backlogged areas have already been addressed?

A. I can only speak for company myself and my particular FMA that, yes, we have gone back and treated most of the backlogged areas and at the moment our tending program is declining in scale.

We started out in 1981 with a program of about two to 3,000 hectares per year, and in 1988 we reached a peak in the nine to 10,000 hectare range, and for 1990 we are proposing to spray approximately 5,700 hectares.

Q. All right. I think that's enough on that topic. I would like now to move to page 100 of the witness statement. I'm looking at the last paragraph on the page where you refer to Table 5 and make the statement that:

"From 1982 to 1989 the level of 2,4-D was relatively constant."

Do you see that?

A. Yes.

Q. Now, I looked at Table 5 and I didn't

come to that conclusion, I came to a slightly different conclusion. I looked at the trend between 1982 and 1985 and according to my calculations there is about a 41 per cent increase in the area treated with 2,4-D over that period.

A. Just give me a second here while I find my Table 5.

Q. It's also on page 103 of the witness statement, Mr. Stanclik.

A. 2,4-D -- well, I said relatively constant. If you --

Q. The numbers are there, I see, and it's gone from 8,000 hectares up to a total of 21,830 hectares. That's a pretty dramatic increase. In fact, if you take from zero to 21,830 you get an even more dramatic increase. That's a fairly substantial increase.

A. Very well, if that's your interpretation.

Q. And then if we look at 21,830 down to 1989, we see a fairly substantial decrease in 2,4-D, in fact the decrease is in the order of 43 per cent?

A. Yes.

Q. In fact, if you were to put some -- any simple statistical trend on that, I think you'll

find that the relationship is very close to being significant, if not significant, over those two periods; positive in one case, and negative in the other?

A. Okay. I did not carry out any statistical analysis of these figures.

Q. But you agree that those trends are apparent in that data?

A. There may be a slight -- or there is a trend upwards to '85 and then a trend downwards, yes.

Q. And indeed the trends are remarkably constant; are they not, the only exception being 1983 where there's some reduction from '82 to '83, and then it jumps up again to '84. Otherwise the trends are quite constant; aren't they?

A. Yes.

Q. You may have answered this question before but I feel compelled to ask it, and that is: Given that glyphosate is a more effective herbicide than 2,4-D for virtually all the species of competing vegetation, why would you expect the proportion of 2,4-D not to continue to climb or at least not to increase and the proportion of glyphosate to at least increase or stay the same?

MS. CRONK: Well, I'm sorry, Madam Chair,

the question began with a premise as to efficacy and if Mr. Hanna is relying on someone's evidence in that regard, he should identify it for the panel.

That has not been the evidence, as I understand it, of this panel.

MR. HANNA: I'm referring to the evidence of this panel, Madam Chair, and I'm referring to page 120 of the witness statement. The have given there shows glyphosate on the top and 2,4-D on the bottom line, and I think in all cases shown in this graph the level of suppression is shown to be higher than it is in the case of 2,4-D.

MS. CRONK: Well, that's exactly my point, Madam Chair. That's not -- Dr. McCormack gave considerable evidence about what this table means, suppression factor you will remember being one element, effect on crop trees being another.

Perhaps the way to deal with it is if you're going to start the question by putting a premise, let's make sure the panel agrees with the premise.

MADAM CHAIR: What is your question again, Mr. Hanna?

MR. HANNA: The premise that I put to the witness, Madam Chair, was: Given that glyphosate is

more effective than 2,4-D for virtually all species of competing vegetation. I understand Ms. Cronk is taking issue with my use of the word effective.

MS. CRONK: No, actually I'm not at all.

MADAM CHAIR: Ask the witnesses if they agree with that conclusion and then go on.

MR. HANNA: Q. Mr. Stanclik, do you agree with that premise?

MR. STANCLIK: A. Could you repeat it, please?

Q. Surely. Given that glyphosate is more effective than 2,4-D for virtually all species of competing vegetation as shown on Figure 1 on page 120 of the witness statement.

MR. STANCLIK: A. I will say that -- I'm sorry, I didn't catch the question in your statement.

Q. It doesn't sound right because I'm giving you the premise. The premise to the question was: Given that glyphosate is more effective than 2,4-D for virtually all species of competing vegetation; I'm asking you, do you agree or disagree with that premise? And the basis for me to use that premise is the figures shown on page 120.

A. It does appear to be -- have a wider spectrum of control and is able to control more species

more effectively.

Q. Okay. So let's continue on then.

DR. McCORMACK: Madam Chair?

MADAM CHAIR: Yes, Dr. McCormack?

DR. McCORMACK: If I may -- since I constructed that figure, if I may point out, I think perhaps a point of confusion here.

The figure expresses suppression which is not necessarily synonymous with silvicultural efficacy, which I understand may be the question at hand here.

In terms of effectiveness, there are some differences here in terms of how a manager might utilize this information relative to silvicultural effectiveness.

MADAM CHAIR: In order to assist Mr. Hanna, Dr. McCormack, could you give us quickly the other considerations in assessing silvicultural efficacy, suppression being one?

DR. McCORMACK: Yes. Figure 1 relates to relative levels of suppression for the four herbicides which are shown there. This shows what the relative capabilities of each herbicide is, however, when a manager makes a decision to treat, he considers all the vegetation present and how he can achieve the silvicultural effectiveness.

And in cases, for example, where ground cover wants to be -- the manager wants to maintain ground cover but still suppress much of the woody brush present, if that is the objective in the silvicultural operation, then 2,4-D would clearly be the most silviculturally effective tool which could be used; on the other hand, if a manager wants to control grasses and raspberry, then the choice would be glyphosate as the best way to go in that case.

So in terms of managing the vegetation and as that relates to silvicultural effectiveness, one uses these characteristics but it is not necessarily the case that you want to suppress all the vegetation present.

There are also considerations in terms of interactions with the crop trees as well, that if one injures crop trees in a process of carrying out tending, then the silvicultural effectiveness is not sound.

MR. HANNA: Thank you, Dr. McCormack man.

MR. MARTEL: Can I ask one question, Mr. Hanna?

MR. HANNA: Yes.

MR. MARTEL: Would there ever be a time when you would want to suppress everything that was

there, the woody and the cover as well?

DR. McCORMACK: All vegetation present?

MR. MARTEL: Save and except the commercial tree?

DR. McCORMACK: Everything but the crop trees?

MR. MARTEL: Yes.

DR. McCORMACK: Sometimes people think in that direction, but in the final decision it is unlikely because of the need to maintain some vegetation; and, secondly, in order to achieve that level of removal of competing vegetation, that is when cost considerations, amount of chemical used come into play and it is usually not necessary to go that far. So it's in effect spending money that doesn't need to be spent.

MR. HANNA: Thank you, Dr. McCormack, for that explanation in terms of efficacy. It doesn't change my question, in fact that was the understanding that I had when I made this question.

Q. And so I will put the question back to Mr. Stanclik again. Given that glyphosate is more effective in the terms that Dr. McCormack meant on Figure 1 on page 120, why would you expect the proportion of 2,4-D not to continue to climb or at

least not to increase and the proportion of glyphosate to continue to increase?

MS. CRONK: Madam Chair, I won't object to the question if it's put to the witnesses without that premise. The premise is not consistent with what Dr. McCormack has just said, with what he has said this figure means, and it's not consistent with the two and a half days' of evidence that the panel has heard.

I don't object to the last part of the question at all, but the supposition is simply incorrect.

MADAM CHAIR: You seem to be trying to determine what the future use of 2,4-D will be, and Mr. Stanclik can answer that.

MR. HANNA: I'll withdraw it, Madam Chair. I have no problem with taking the premise off the question.

MR. STANCLIK: Very well. The decline in 2,4-D has been due mostly to the forest manager using the appropriate herbicide for his or her particular site competition combinations.

MR. HANNA: Q. And so we've now reached the appropriate proportions more or less in '89 as shown in figure Table 5?

MR. STANCLIK: A. That I cannot tell

you.

Q. So there isn't -- you can't provide for me any indication looking at this table and saying -- well, one thing you have been able to say, or at least the panel at least for their own particular case has said, that the level of treatment that we see in 1989 is likely to remain constant for the foreseeable future, the 63,000 hectares plus or minus 10 per cent type of a thing. That's a reasonable expectation for the future?

A. I don't know if it's plus or minus 10 per cent, but it is not anticipated to increase much more.

Q. And with respect to the proportions treated by 2,4-D and glyphosate, based upon the best information you have available at this time, do you expect those proportions to change dramatically in the foreseeable future?

A. I can't comment on that because it depends on the forest types that are encountered in the future by each FMA. If you end up encountering sites that don't require glyphosate, then you won't use glyphosate; if you end up encountering sites that have species that 2,4-D will control effectively, then you will be using more 2,4-D most likely.

Q. Okay.

MR. BUNCE: A. I think also, to add to that, that it would be very hard to predict, for example, if hexazinone became available, then may be the scenario would change again and it's very hard to predict at that time what could happen in the future.

Q. All right. I appreciate that, Mr. Bunce, that's why I said the foreseeable future and I put that in the unforeseeable future, although I suppose we could do scenario analysis of what happens if we get differenct chemicals.

In fact that's my next topic. I would like to deal with Dr. McCormack on Section 5 which starts with page 155 I believe.

MADAM CHAIR: 165, Mr. Hanna?

MR. HANNA: 155, Madam Chair.

Q. And I believe, Dr. McCormack, you and Dean Carrow were identified as being responsible for this section, but seeing my question will deal with herbicides, I'll keep you in the hot seat.

DR. McCORMACK: A. And this section you refer to does refer to herbicides.

Q. Okay, even better.

MR. CRONK: It was actually, Madam Chair, Mr. Tomchick and Dr. McCormack. This section deals

clearly with herbicides, it didn't involve Dean Carrow.

MR. HANNA: I stand corrected. I wanted to ask Dr. McCormack the questions regarding this.

Q. Now, this section argues for research and development to permit additional chemicals or herbicides to be registered for use in timber management; is that correct? That's the basic thrust of the argument?

DR. McCORMACK: A. That's a major message within this section, yes.

Q. And one of the reasons you're requesting such an effort is to provide foresters with greater and more cost effective control of the competing vegetation; is that correct?

A. Plus control as well as prescription options to match the treatments with the vegetation system on the site requiring treatment.

Q. And that's what I meant by greater control, so that you have the ability to manage the site more appropriately based upon what you're trying to achieve?

A. Provides options in manipulating -- more choices in manipulating the vegetation depending on the species present, yes.

Q. Now, if your recommendation is

adopted and is successful in developing additional chemicals, is it reasonable to assume that foresters will be able to improve the predicability of future wood supplies?

A. I think that would be part of being able to improve that, but I think the major thrust here is within a given set of dimensions of timber production that forest managers -- timber managers can do a more appropriate job. As they manage the vegetation, they would have more choices in selectivity and retaining vegetation components than they have with the herbicide tools available at the present time.

Q. So isn't that still saying that they have greater control; control not only in terms of commercial species, but other species also, more ability to manipulate the species?

A. It's a broad sense of the use of the word control, yes. Unfortunately within the weed science community when you talk about control, that usually imparts the thought that you are controlling in the way of suppression, and that was my point of confusion.

Q. Okay. I'll just get a word that's better for us. Be able to better manage, better manipulate, is that the word that --

A. Yes, I think that's more appropriate in my line of thinking, yes.

Q. I will try to use the word manipulate as opposed to control from now on.

A. I think we have a mutual understanding. Thank you.

Q. And does it follow that in order to -- if these chemicals come on stream, foresters will be better able to predict the structure of the forest in time and space as a result of greater manipulation of the vegetation?

A. There would be more potential structures available which they would be able to predict, yes.

Q. There's a greater range of alternatives available to us as these additional management tools become available to us?

A. Very definitely the case.

Q. Now, this type of phenomenon is apparent when glyphosate was introduced; is it not, to an extent? Glyphosate provided the forest manager with the option to -- in this case I think I will use the word control competing vegetation and, hence, in some circumstances to provide greater insurance in terms of wood supplies?

A. Glyphosate had a spectrum of efficacy that was different from the herbicides which were available at the time that glyphosate products came on line and, in that case, yes.

Q. It wasn't a panacea, but it expanded the range of tools that the manager had available to him?

A. Yes.

Q. And, therefore, greater manipulation?

A. Yes.

Q. Now, I'm speaking now and trying to come at this from the point of view of people outside of the timber production side of things, and I'm looking at it from this point of view: As more chemicals are made available that provide a higher degree of manipulation in terms of competing vegetation, would you agree that one must become increasingly more conscious of the future implications of the forest?

As you manipulate more, you must take more into consideration in terms of what the final dynamic might be because you have more control?

A. This is so, but we must keep in mind here that we are dealing with species of vegetation for which we have a great deal of experience, so that we

are still dealing with the same species, we just may be changing their relative proportions as we go.

Q. Now, when you say species, you're talking about tree species?

A. I'm talking about plants.

Q. Commercial tree species?

A. We're managing vegetation, so I'm referring to all plant species that might occur on a site, including lower vegetation as well as those that we would consider to be trees, those with single well-defined woody stems.

I'm referring to everything from low ground vegetation such as partridge berry and grasses right on up to a mature spruce tree.

Q. I'm coming at this from a point of view of looking at the future, trying to forecast what the forest is going to look at. My experience in dealing with timber management plans is I have yet to see one project partridge berry in future stands.

Now, that may just be because I'm not sufficiently aware of timber management plans, but I haven't seen that yet in timber management plans.

And I guess the point that I'm raising is, that as we develop these tools, the ability to manipulate the system more and more, that we have the

ability to influence not only the commercial species - which is what I'm used to seeing in timber management plans - but the whole spectrum of woody vegetation in the forest; would you agree?

A. Well, I agree, and I point out that when we conduct research on spectrum of activity of herbicides which includes new herbicides which may be coming on line, when we evaluate species we do evaluate such species as partridge berry and bunch berry and a variety of plants present on the site.

We gather data on these species, those data are available to managers. We certainly consider them when we put our data together and as guidelines are developed.

Q. And to the extent that those are important in terms of non-timber values, you would agree then that that knowledge that you have developed as a researcher is important in terms of analysing those forest dynamics?

A. Yes, and we find this information especially valuable because I'm approached, for example, by wildlife biologists and managers who have primary concern of the animal populations on the sites.

They deal with us in these data -- with these data on a regular basis so that they can better

understand the dynamics of the vegetation with which they are concerned.

MR. MARTEL: May I ask a question?

MR. HANNA: Certainly.

MR. MARTEL: I'm a little bit concerned. If we're talking about herbicides to knock back something for one or two years to give the crop tree an opportunity to develop, surely our interest isn't to try to manipulate the forest to eliminate what's there naturally, that in fact all we're trying to do is control for a temporary period of time to get the crop tree going; otherwise, who in the hell knows what we would be ending up with if we started to just ravage everything that's out there.

DR. McCORMACK: Well exactly so, with the exception that as different levels of shade develop the natural course of events proceeds.

However, I point out for your information that as we evaluate the spectrum of activity and we find herbicide treatments - it may be a rate of active ingredient or it may be a specific herbicide - that we find that those other species that may not be important in terms of the dynamics of getting a crop tree established; that in other words we find a treatment that will accomplish the timber production objective

but at the same time maintain other vegetation rather than inadvertently controlling them, then we rate that in our reports as an advantageous and desirable treatment.

MR. MARTEL: Yes, but the only question I'm trying to get my head around is that, surely our intent is not to go out there and tell Mother Nature what she should be growing for us, that our intent when we knock this stuff back is to control to give the opportunity for things to take off; otherwise does anyone know the effects if we were eliminating a whole species out there, what the effects it could have on everything else.

DR. McCORMACK: Exactly, and it's a temporary advantage for the crop trees and exactly why we study the plant species present and the diversity on these sites to make sure we are not seriously disrupting them.

MR. MARTEL: Thank you.

MR. HANNA: Q. To follow up on that, Dr. McCormack, Mr. Martel has hit the nub - as he normally does - as to what I'm trying to address through this line of questioning and, that is: That as we develop these tools that you are promoting or suggesting we should develop in Section 5, we develop a greater

ability to manipulate the forest dynamic and that includes not just commercial tree species but other species that may have other values associated with them.

As we develop that greater ability to manipulate the system, it requires us to look very carefully at the dynamic implications of that.

If we have very little control, there's really not much point in looking very far because we can't control it; but as we control it more and more, we have to look further and further into the consequences of that control as we intervene more?

DR. McCORMACK: A. I would like to think that managers look as carefully as you've described as they carry out the tending treatments which are available to them today, and that's responsible management.

Q. And as you develop more -- a greater ability to manipulate, encumbent on you is the responsibility to investigate the implications of that?

A. Understand the dynamics that will follow the treatment, but I repeat that I would expect the same level of analysis, investigation and whatever else might take place on the part of management to be the same as it is today; that it is thorough today and

thorough tomorrow.

Q. But to give you an example. If I didn't hvae glyphosate at the present time and I only had 2,4-D and I couldn't control grasses, I wouldn't have the ability to manipulate the grass cover on the site the same way I would with glyphosate, and so that opens up a new area that I have to consider in terms of my management applications; is that fair?

A. If you only have 2,4-D, obviously then you can't manage --

Q. And as we develop more chemicals, that same analogy will continue and the situation will become more complex and will require greater number of alternatives - how should I say - manipulated states that I can direct the forest in?

A. The conditions analysed would still be the same, but the options to manipulate them would be broader.

Q. Presuming that we develop to increase our ability in terms of tools to manipulate the forest structure, would you agree that there is greater potential for both positive and negative impacts on non-timber values, that we have a greater number of options and, therefore, we've got a greater range of alternatives that could lead to both positive and

negative impacts?

A. Coming from my vantage point, I would like to think that we, the research community, evaluate these materials thoroughly enough that we can avoid any increase in negative aspects of these new materials coming on line and that we would increase the positive options.

Q. Well, I think that's very honourable in terms of what you are attempting to do, but as you know, as we develop them -- to give you an example of the glyphosate again, able to use it responsibly, and I think that's what you're saying, it can lead to even more positive impacts that than 2,4-D in some circumstances but, by the sake token, there are situations where it might not be used as responsibly and it could be more damaging than 2,4-D in those circumstaces?

MS. CRONK: Well, whose evidence is that, Madam Chair? Is that Mr. Hanna's?

MR. HANNA: I am asking Mr. McCormack whether he agrees or not with that proposition.

DR. McCORMACK: I don't agree with that.

MR. HANNA: Q. Can you explain to me why not?

DR. McCORMACK: A. Well, you're

describing a risk of negative results from glyphosate and I would need to hear specific situations or have a specific case described in order to discuss that further.

Within the limits of rates of active ingredient that can be sprayed and in the way the material is delivered to a management unit, a plantation, whatever the area is to be treated, I'm having difficulty envisioning the type of negative situation that I hear you describing.

Q. Let me use an example that you've raised already, it was when when you were describing the efficacy -- explaining the efficacy to me.

The potential exists for a forest manager to prescribe, for example, glyphosate on a deep slope that has an extensive grass cover that could lead to removal of that grass cover, at least partially, and increase erosion whereby -- and 2,4-D could be used also, but might not lead to that result.

Now, you would say that's not a responsible management decision, but the fact of the matter is that option is there, whether or not it would be exercised or not is another question?

A. No, I think not in that on such a steep slope, if there is sufficient grass cover there

to protect the soils of that slope and that slope were sprayed with a high rate of glyphosate, even a higher than allowable rate, the grass would be, for the most part, killed, not all of it, it would not be removed from the site and grass cover is such so that it would stay in place longer than it would take for vegetation to reoccupy the site for a variety of reasons.

One of the major ones being there is absolutely no residual activity following an application of glyphosate so new vegetation can, in a very short period of time, move back on the site and this is not a realistic risk which you've described.

Q. So what you are saying in that particular case is there would no difference whether you use glyphosate or 2,4-D and that you can't think of an example of that particular case that a member of public could bring forward an argument to use 2,4-D instead of glyphosate?

A. No, because it would depend on the other vegetation present that you might or might not want to suppress and you would gain a temporarily advantage over the grasses.

When I said vegetation would reoccupy the site, it is not necessarily going to be grassy vegetation throughout that slope. Grassy vegetation is

one of the most serious, if not the most serious competitors with young conifers, thus, if one can reduce the proportion of grass and maintain vegetative cover of some other species in cases where it was critical to gain that temporary advantage for the spruce trees, I think glyphosate would still be the best choice.

Q. Well, without belabouring this, Dr. McCormack, there are situations where you've said 2,4-D would be the preferred treatment?

A. Very definitely.

Q. And that's preferred for -- because it will have more positive impacts than some of the other alternatives you might have available to you?

A. If things like ground cover are a concern, yes.

Q. And so that as we develop more effective tools, there is a potential for - I will call them - all positive impacts, but the range of positive impacts is broader?

A. Yes. There are some obvious materials that illustrate that that can be available in the near future.

MR. HANNA: Madam Chair, I have one short topic here on predictability of wood supply and I am

not sure, what time were you planning on taking the morning break?

I can keep going, I am quite happy to keep going, but I just --

MADAM CHAIR: I think we are very close to taking a break when it is convenient for you, Mr. Hanna.

MR. HANNA: Okay. I have six questions here, maybe I can just deal with those and we will have a break.

MADAM CHAIR: Go ahead.

MR. HANNA: Q. Dr. McCormack, I would ask you to turn to page 60 of the witness statement which is Section 1 under the heading tending and -- The Need For Tending and Protection.

A. We are at page 60 rather than 59?

Q. Yes, I just read the section heading, but it is page 60 I wish to deal with.

Q. Now, the evidence of this panel clearly indicates that without tending on sites experiencing extensive competition that survival growth and development of conifer species will be severely inhibited. That's your intention; is it not?

A. Are you reading from the text?

Q. No, I'm not. I will be in a moment,

but I'm not yet.

A. I guess I have to ask you that you repeat that.

Q. Sure.

A. I thought you were reading from the page and I was trying to find it.

Q. Is it the intent of the evidence of this panel to indicate that without tending on sites experiencing extensive competition, that the survival, growth and development of conifer species will be severely inhibited?

A. That is so with the most severe inhibition being mortality of the desirable crop trees.

Q. Survival being life or death, yes. Is this not quite predictable; in other words, when we have a site experiencing extensive competition -- first of all, we can identify the sites experiencing extensive competition? We can identify that; can we not?

A. I like to think of these things in terms of odds and probabilities, so you are not absolutely certain, but at least say 80, 90 per cent would be very high on some sites, 10, 20 per cent, and you make your evaluations accordingly, but I never like to put my finger on a specific point.

Q. Well, we won't run a monte carlo stimulation on that, but the problem is there are certain sites where there is a high probability we will run into extensive competition?

A. I like that better, yes.

Q. That's quite predictable given there is--

A. Yes.

Q. --some uncertainty associated with. It is reasonably predictable?

A. In most cases, yes.

Q. Okay. The reason I raise that is because on page 60, the first full paragraph there, it says:

"The unpredictability of wood supply through unplanned depletions can seriously disrupt the timber management plan for any particular management unit and can negatively impact the long-term wood supply flow from the forest."

And I was honing in on the word unpredictability there and the matter of unplanned depletions. Is it not fair that another way to deal with the matter of competition to say, on that particular site there is a high probability I will have

severe competition, there is a high probability that I will have inhibition of growth and development of my conifer crop and to build that into my prediction of wood supply?

A. I think we can readily anticipate competition and initial growth of potential crop trees, but at this stage of the game we are dealing with potential crop trees and I would not want to, in these discussions, try to relate that directly to wood supply.

DEAN CARROW: A. Mr. Hanna, I may be able to help in clarifying that particular statement as well--

Q. Certainly.

A. --in the sense that it doesn't specifically refer to competing vegetation. The term depletions generally refers to unplanned depletions, unpredictable depletions in the form of wildlife, insect outbreaks and disease outbreaks.

Q. I appreciate and I think the Board has heard a great deal of evidence on the many factors that control the structure of a forest.

The reason I honed in on this, is this was under the section Need for Tending and Protection, and I am interpreting this - and maybe I am

interpreting it incorrectly, if I am you can correct me - that one of the reasons for demanding tending was to increase the predictability of future wood supply and thereby -- by reducing what are termed here unplanned depletions?

A. It is one of the reasons for demanding protection as well.

Q. Oh, I appreciate protection also.

A. And that the unpredictability that referred to there I think can be related more much strongly to losses due to fire, insects and disease.

DR. McCORMACK: A. If I may, Mr. Hanna, give my own viewpoint of the role of vegetation management at this stage.

We look at this from the standpoint of whether or not a new stand has been established which provides the manager the option of managing, not managing or how he or she manages the stand, and that's where it starts to relate to the later considerations.

We are dealing in this vegetation management only at the early stages of stand establishment.

Q. And was that what you meant by having difficulty relating this to wood supply, that there is all these -- in the intervening time there is a lot of

things that can happen before you finally harvest the wood? I just want to understand.

A. In the case of vegetation management, you provide managers with the opportunities, but how they manage from them on or later are management decisions. That's where it would relate more to wood supply.

Q. Right. What I'm trying to understand is with respect to tending. I've certainly heard what Dean Carrow has said with respect to protection and I'm not pursuing that.

A. I think I've just explained where I see tending within this framework.

Q. With respect to unplanned depletions and predictability, those are the two operative terms. I don't have any problem with what you've said, I am trying to relate it to go back to this concept of predictability and unplanned depletions.

A. I think I've explained as best I can where vegetation management fits in and I'm afraid I have to leave it up to you to carry it into the later stages.

MR. HANNA: Madam Chair, I think that's adequate for that topic.

MADAM CHAIR: We will take our break now?

MR. HANNA: Yes. I am doing my best to achieve Mr. Martel's objective he set for me. I probably will not be able to make it by noon, but I will certainly be finished by mid-afternoon going at the current rate, so I just notify that for other parties.

MADAM CHAIR: Thank you, Mr. Hanna.

We will be back in 20 minutes.

---Recess taken at 10:30 a.m.

---On resuming at 10:55 a.m.

MADAM CHAIR: Please be seated.

MR. FREIDIN: On behalf of Ms. Cronk, Madam Chair, could I just ask that you stand down for a minute, she will be right here.

MADAM CHAIR: Thank you, Mr. Freidin.

MR. HANNA: I thought you were going to say you were going to take her place.

MR. FREIDIN: Notice how I am holding my tongue.

MR. HANNA: Dr. McCormack, just so you are ready, I am going to the top of page 61, so you might want to get that ready.

DR. McCORMACK: Page 61.

MS. CRONK: I apologize, Madam Chair.

MR. HANNA: Q. Dr. McCormack, I would

like to continue now with Section 1 and particularly page 61 under the heading The Need for Tending, and I am looking at the quote in the middle of the page towards the bottom there from Walstad and the second sentence in that quote which says:

"Vegetation management is also used to enhance wildlife habitat, stabilize soil, maintain right-of-ways and facilitate recreational use."

I take it, seeing that you've included this in your witness statement, that you agree that tending and the subsequent manipulation of the forest structure affects not only the yield of timber products, but also the yield of other non-timber products such as wildlife habitat and recreational use?

A. As I pointed out, the focus of this panel is timber production but, as stated here, we recognize that these other benefits do take place.

Q. And they're also impacted by the manipulation that is intended for timber?

A. In the course of managing the vegetation as stated, yes.

Q. And because they both depend upon the structure of the forest and that's what we're manipulating through tending, in essence they are

inseparable?

A. They are with the qualification that most tending occurs in early stages of this forest development.

Q. I'm going to deal with that in just a minute. Can we turn to page 62. I'm looking at this quote also from Walstad, I believe, and particularly the third numbered paragraph there and the statement that:

> A singular event, and I understand that to be, for example, a tending treatment, that tending as a singular event may "cause changes in the plant community structure, composition and stand density that determine pattern of ensuing successional stages."

Would you agree?

A. Yes.

Q. And it's fair to conclude there that while tending may be a singular event, the effects may be quite long lasting in terms of the structure of the forest and the -- the structure of the forest in the way that I've described before in terms of species competition, stand, stocking, pattern of the stand, all those various factors?

A. Yes, that is an objective in carrying

out the vegetation management.

Q. Now, before the break Mr. Martel was speaking to you about the fact that the impact of tending may be a suppression of the vegetation, I think he used two years, in some cases it could be longer than that, but there's this short-term suppression of the competing vegetation, but the effects of that may be felt for the entire life of that stand.

Would you agree?

A. Especially with respect to crop tree numbers and development, but the consideration here is that species present are never totally removed, the proportions change.

Q. And those proportions are often very important for non-timber values?

A. I am hesitating over the qualifier 'often', that being a relative --

Q. Okay, let's take that qualifier out. They may -- in some circumstances those non-commercial species may be very significant for non-timber values?

A. Yes.

Q. In order to fully appreciate the implications of such singular events, tending, one must consider both the spacial, in terms of the land areas, being managed, and the temporal aspects of the forest

dynamic; you can't just look at the one site that you're treating, you have to look at in terms of the forest?

A. Definitely.

Q. Over time?

A. Yes.

Q. Can we turn now to Section 2 of the witness statement and particularly on page 69.

Now, before I go into this, perhaps I'll just tell you where I'm coming from in this. It might help you in answering some of the questions. It seems to me there's two ways we can go about this matter of dealing with tending. One way is to set out in very explicit terms the structure of the forest that's desired over time and that structure of the forest may be dealing with commercial and non-commercial species, overstory, understory species, it may be a fairly detailed description of the stand depending on what are the key factors that need to be managed in that particular site to achieve the benefits. That's one way of going. You understand that as a possibility?

A. Yes.

Q. Okay. A second possibility is to, instead, each time a management action comes forward, evaluate that management action relative to its

consequences in those terms.

The reason I raise that is because I'm going to deal with this matter of choice among tending alternatives and it depends very much on where this -- how this line of questioning and how -- what the premise is underlying this section; in other words, have you laid out here in terms of the choice of tending alternatives the fact that we've already decided on a forest structure we want to achieve, defined at whatever level is appropriate, and this is the way we go about evaluating tending alternatives to achieve that structure, or is this designed -- this section designed as a basis to review each tending activity in terms of its consequences in terms of forest structure?

Do you understand the two, the difference there? I realize it's somewhat subtle, but it's very important I think.

A. Or can we consider both in cases rather than one apart from the other.

Q. Okay. Well, let me just tell you why I try to separate the two.

A. I need to understand what you are leading to.

Q. The reason that I wanted to separate

the two is, I see two ways of going about timber management in this province. One is to say to forest managers, as the public: This is the forest structure we would like off the land base, with an understanding of certain benefits that will be realized from that forest structure, and then the forest manager said: You achieve that in the way that's most efficient and most reliable in your professional judgment as a forester. That's one management regime.

Do you follow that?

A. I do.

Q. The other management regime is that each time the manager decides to take an action, the public looks over his shoulder and says: Okay, are you going to spray glyphosate here, are you going to spray 2,4-D and let's see what the implications are and we will decide on each action whether that's the appropriate -- what the consequences of that might be and whether or not that's in the best interest.

MS. CRONK: Excuse me, Dr. McCormack.

Madam Chair, Mr. Martel, these kinds of questions are the same kinds of questions that I had difficulty with from Mr. Hanna on the renewal panel and that is, Dr. McCormack has been qualified before you to speak to very particular things based on his

experience. He has not been qualified before you based on his experience in management systems, formulation or design of management systems or generically the policy issues involved in management systems in this jurisdiction or, indeed, in any other.

It may be, frankly, I don't know, I have never asked him, he may have experience in that in his own state, but he certainly doesn't here and he certainly hasn't been qualified for that purpose.

I have no objection to any question relating to the planning of tending activities, that's why this panel in part is comprised of five industry representatives, I have no objection to any question relating to the purpose of, what is involved with, the effect of tending, that's why Dr. McCormack is here, but I am going to object to this question and any line of questioning that's based on the design, formulation and policy considerations inherent in a management system in this province because that's not, in my respectful submission, what this panel is properly before you to speak about at all.

MR. HANNA: Madam Chair, I hear Mr. Cronk's objection and I think I understand where she is coming from.

It is not my intent to ask this panel and

to seek from them evidence in terms of what is the most appropriate planning system for the province. The section I am dealing with, however, is called the choice among tending alternatives. Now, the way in which that choice is made -- the context within which that is interpreted is very critical.

If this choice among tending alternatives is a choice, as I have described in the first instance, where there is a clear end point set out and this is the choice process that a forest manager would go through to achieve a certain end point, and I can tell you that there isn't -- I haven't a lot of concerns with the way this is structured.

If, however, this section is saying this is how we will choose among tending alternatives in the province and that the public will be asked to comment ultimately in the planning process, then I have concerns and I can give you an idea of some of the concerns that I have.

On page 69, with the criteria that have been listed out, there is five criteria listed there, you will note the only reference to non-timber values is proximity to non-timber values, suggesting that the area being tended is separate in some way from non-timber resources.

I think it is clear from the discussion I've had with Dr. McCormack this morning that, at least in his view, the two are inseparable; they both depend upon, in many instances, the same forest, it is simply a matter of what their ultimate use is. And that's the reason why I am trying to lay out with Dr. McCormack what the groundwork, what the premise is for laying out those criteria.

It's very critical to me in terms of the line of cross-examination I carry forward with this panel because if the panel is saying we have got a clear end point and this is simply, as a forester, how I will go about trying to achieve that end point, then, as I say, I haven't got a lot of problem, but if this is the, if you will, criteria that will be used to select tending alternatives and that the public will be given in terms of justifying tending alternatives, then I have a concern and I wish to puruse that.

So that's the reason why I have gone this way, not to establish with this Board what the appropriate planning process is, but what the premise is upon which this section has been written.

MADAM CHAIR: Maybe we are being more complicated -- the question is more complicated than it has to be. If you are trying to determine how tending

decisions are made vis-a-vis non-timber values, why don't you put some questions to the practitioners we have here.

That's what you are trying to determine, that when a decision is being made about whether or not to tend and which type of tending will be selected, you want to know how they consider non-timber values in that assessment?

MR. HANNA: I believe, Madam Chair, it's a level above that. By that I mean, I see it really as two very fundamental paradigms in terms of the way we look at management. One is, the timber management planning process essentially comes forward and decides upon a forest structure over time and space that is deemed desirable, and then the various timber management activities that the Board is only too familiar with, are then the tools whereby that is achieved.

And my submission would be, on behalf of my client would be, that would be the realm of the technical expert, to use those tools in the best way to achieve that end.

The alternative paradigm is that every time a decision is made, that that has implications in terms of non-timber values, for example, and each

decision has to be reviewed in that context. That's not a management philosophy that my client is promoting, but if that is the management philosophy underlying this section, then that's very important for me in terms of cross-examination.

MADAM CHAIR: I think the Board accepts Ms. Cronk's point that she was making yesterday and today; and, that is, that Dr. McCormack is not a management expert in the Ontario jurisdiction, but certainly we do have company managers here who could respond I think better to a question like that, although I am still not clear what the question is.

MR. HANNA: All right, let me say this. The reason I ask the question to Dr. McCormack is because he had been indicated as being responsible for this section.

If the premise on which this section has been written has arisen from the other panel members, I am more than happy to ask them for that clarification. So perhaps I will ask that.

MS. CRONK: Can I just try again, Madam chair, to help if I can and then I will rise no more on this issue.

Any questions relating to the planning of tending activities as it effects the OFIA/OLMA

operations should be put to the Industry witnesses on this panel. Mr. Hanna can pursue what he perceives may be or perhaps was the premise of any particular chapter or section of this book, but I can assist him right now by telling him that management philosophy, to the best of my knowledge, wasn't a premise of any part of this document except as it relates to operational activities, whether that helps him or not, but he has brought the concept of underpinning the management philosophy to this section, these witnesses didn't.

In any event, I promise I will not rise on this issue again unless I absolutley have to.

MR. MARTEL: Why doesn't Mr. Hanna simply ask Dr. McCormack on what premise was this section written.

MR. HANNA: Would you like to try that one then, Dr. McCormack.

DR. McCORMACK: So that is the question?

MR. MARTEL: I hope that's the question he is looking for an answer for without dealing with planning.

DR. McCORMACK: As titled, Section 2 address the choice among tending alternatives. The basic choices for Industry are listed at the bottom of page 69.

The basis for making that choice from a tending perspective are outlined at the top of that page, and from there we go on to considerations from a tending perspective, how a choice is made from among the alternatives that are listed there on page 69, and the section attempts to describe just that; the characteristics, the advantages and drawbacks of these choices, so that a decision can be made, but anything that relates to actually making the decision after considering the content of Section 2 is not here.

MR. HANNA: Q. Dr. McCormack, perhaps I can help you with this question then.

I don't see any mention in the choice among tending alternatives, the criteria listed there, of the implications of the tending activity on the spacial and temporal dynamic of the forest and, hence, the impact on non-timber values. I don't see that captured anywhere in your discussion.

I can see a reason for that if the first assumption is being used, and that's why I've asked the question.

DR. McCORMACK: A. As I've indicated, the focus here is on timber management and one can read these sections as the tending options are described and envision characteristics of each option as one might

want to relate it to other uses or considerations of their choice, but it was not intended in this section for us as a panel to address those types of considerations.

We considered that -- not that we do not think about these things, but it was beyond the scope of this section.

Q. So you are saying those are important variables but they aren't listed here in this section; is that what I'm hearing?

A. Not specifically as such.

MR. TOMCHICK: A. I think, Mr. Hanna, if I could be of a little bit of assistance here, when we speak of or consider the silvical characteristic of a species, inherent in the silvical characteristics are its spacial and temporal characteristics. So those are things that are inherent in silvical characteristic.

So in that respect, the spacial and temporal characteristics would be considered, as well stand conditions. A stand changes in time, that's a temporal characteristic of that stand. So it's not specifically stated here, but they certainly are considered.

Q. Mr. Tomchick, I appreciate that clarification. I guess where I am coming from is,

while this describes from a forestry point of view the factors that will affect the temporal and spacial structure of the forest, which you've just described to me, the choice, the -- a factor in determining that temporal and spacial dynamic is non-timber values in addition to timber values.

And I see, for example, here the only mention with respect to non-timber values is C where it says: "Proximity to non-timber values..." suggestion a separation of the two?

A. That may be the suggestion or the implication that you get out of it, but proximity does not necessarily mean that those areas are separate. Proximity may indeed mean the areas are contiguous.

Q. Well, maybe we are advancing here, then. So I could say then, take into consideration non-timber resource values, proximity is not necessary then as a word, it's simply take into account non-timber resource values whether they are adjacent or coincident with the area being tended.

Is that a fair interpretation of what you are saying?

A. That is one interpretation that you would get from one interpretation.

Q. I want to get your interpretation as

a panel of how to interpret that, so that's what I'm interested in. What is your interpretation of it? Is that a fair interpretation?

A. The interpretation is that the non-timber resource values and how they relate in terms of where we are spraying, whether it be beside or on or adjacent to, that is how proximity -- what is meant by proximity in this case.

Q. And the non-timber resource values are considered in the same termporal and spacial context as the wood supply in your view?

MR. BUNCE: A. The non-timber values are identified at the five-year plan stage and are addressed at that stage; are they not?

So what we are dealing with here is the timber timber management plan and the non-timber values are identified and address, for example, as to whether tending would even be considered in an area where the value was at the five-year plan stage. So they are taken into account at that point, as I understand it.

Q. I think, Mr. Bunce, you are talking about areas of concern now; is that correct?

A. Well, I'm not necessarily talking about areas of concern, I'm talking about the values that are identified and they become an area of concern

if they are in an area that we are talking about, yes.

Q. But I'm talking about more than areas that are identified as values or simply areas of concern. I'm now talking primary about normal operating areas in the management of the forest structure in time and space on normal operating areas and the implications there in terms of non-timber values.

I am wondering how that is dealt with in term of the choice of tending alternatives.

MADAM CHAIR: Mr. Hanna, this isn't being helpful to the Board when you talk about time and space with respect to the forest. Can we use a specific example? Could you use moose habitat or could you use --

MR. HANNA: I will use moose habitat.

MADAM CHAIR: That will be more helpful.

MR. HANNA: What I'm -- I guess the drift of it is this, that the structure of the forest - and the forest here we are talking about a conglomerate of stands not an individual stand - how that changes, succession is the way the plant scientists talk about it, how that forest evolves over time is critical in terms of wood supply, it is also critical in terms of non-timber values.

The question I'm trying to get clarified here is, in choosing among these tending alternatives, how is that implication in terms of succession, the evolution of that forest, dealt with with respect to non-timber values?

So that's -- is that helping at all? If you want to talk about moose, I don't mind talking about moose. Different serial stages, different successional stages of the forest have different habitat, provide different habitat components to moose; some are browse, some are late winter cover, some are calving sites, et cetera. So that dynamic of the forest affects wood supply, it also affects the nature of the wildlife and recreational use, various other uses of the land base. So that's what I mean by space and time.

MADAM CHAIR: So your question is: When Industry plans to spray a plantation do they consider what affects it would have on moose habitat, for example?

MR. HANNA: Over time and space in terms of succession of the forest, not simply in terms of that impact in terms of the available supply of browse at that point, but also the whole cycle of forest succession that that puts in place, puts in motion.

MADAM CHAIR: Do you understand that question, witnesses?

MR. BUNCE: Not totally. The only thing I can think of is, at the timber management planning process I am under the assumption that there is a biologist, a moose biologist on the planning team when that process goes through, as it stands now, and that person identifies the moose habitat and the types that are required in the normal operating area and those are spoken to at that time, and the alternatives of whether to tend or not would be addressed at that time at the five-year stage.

I am not sure if that's --

MR. HANNA: Q. Sorry, Mr. Bunce.

Dr. McCormack, you have a little bit more experience in dealing with some of your papers on wildlife. Have you been understanding what I am driving at?

MS. CRONK: Well, again, the question is now coming back to Dr. McCormack as it relates to planning in this province and what is done with respect to the assessment of these kinds of values and the impact of successional stages of the forest. Those are not questions that should be put to Dr. McCormack.

MR. HANNA: I have to differ with Ms.

Cronk on this point. The question I put to him was not how the planning process should work in the province or whatever, but the nature of the concern in terms of, from a scientific point of view, the need to consider the implications that's been used in the witness statement, the singular event on the time and space dynamic of the forest in terms of non-timber values.

That seems very straightforward. It's a scientific question, not a planning question at all.

MADAM CHAIR: Dr. McCormack?

DR. McCORMACK: Yes, it's not clear to me exactly where we are at this point.

MADAM CHAIR: I think you are being asked as a scientist and not a planner or someone with experience in the Ontario jurisdiction, to say whether you think that when planning is done for spray operations that those plans should consider non-timber values and the affects in the future of forest succession.

You've already given us the answer that with respect to this evidence you think it's beyond Section 2.

DR. McCORMACK: In terms of making the choices among tending alternatives. However, in making those choices the manager considers the vegetation

dynamics, but we are talking here about managing vegetation and what that amounts to is managing the vegetation dynamics which takes place on a site, and when a tending activity is imposed on a site the immediate vegetation dynamics are definitely evaluated and projected, and from that follows a professional who knows the vegetation in the area and what will happen over a longer term following the tending activity.

So if that's addressing the question that he meant, I think it is inherent in what is said here that vegetation dynamics are considered beyond the point of the tending activity and how they develop part of what happens on the forest and the managers know that these things are going to be happening.

MR. MARTEL: You just consider what happens to the vegetation at that time, or do you take into consideration what happens to all other values at that time?

DR. McCORMACK: From my perspective, we definitely look at what changes in this vegetation are going to take place and how that may relate to habitats and a variety of non-plant organisims on the site, yes.

MR. MARTEL: I think that is what Mr. Hanna is trying to get at, what happens when you plan.

DR. McCORMACK: I am certainly

comfortable personally saying this, we are dealing with an ecosystem here and an ecosystem is composed of many different parts and/or organisms, and whenever we enter and change part of the structure of that ecosystem other things will change at any time and we have to be cognizant of those changes or the potential for those changes, and I think that is inherent in this management process that we are addressing here.

MADAM CHAIR: Is it your view that tending makes the forecast for forest succession more predictable?

DR. McCORMACK: In many cases I would say so, yes.

MADAM CHAIR: Mr. Hanna?

MR. HANNA: Dr. McCormack, can we return then to page 69 and I will ask you this question.

Are the criteria listed here intended to outline the considerations to be used in deciding whether or not tending will take place and the intensity of tending that should take place, or are you saying that the decision has already been made regarding the intensity of tending that should occur and this section is describing how alternate tending techniques should be selected?

DR. McCORMACK: A. The first decision is

directed towards whether tending is necessary or not; thus, Option 6 at the bottom, no treatment required, is in fact part of this package written here. If in that process it is decided that tending is necessary, the next step would be to choose the alternative which is most appropriate to carry out the tending.

Q. Would you agree that both the tending technique and its intensity will influence the future structure of a stand?

A. Yes.

Q. Does it not follow then that since the structure of stand and the overall forest affects non-timber values, that these values should also be a consideration in deciding whether or not tending should take place and the intensity of tending?

A. It is my personal opinion, recognizing that I am not in a position to speak for specific management entities in the area of the undertaking, that those considerations do take place.

Q. And you would agree that in your professional opinion that those consideration should take place?

A. Yes.

Q. On page 83 you deal with the no-treatment required alternative and the third

sentence there indicates that the:

"Selection of this option..." the no-treatment option "... is based on operational restrictions or evaluations which indicate there are insufficient quantities or types of competing vegetation to warrant control."

Are there not circumstances where non-timber values might lead to the selection of this option also?

A. In terms of how such a decision is made in the area of the undertaking, I would have to defer to the managers who are represented here in the panel as to whether or not and how that takes place.

Q. Okay. Dr. Bunce, you volunteered before, how about volunteering again. Do you want me to ask the question again?

MR. BUNCE: A. I will at least need the question again.

Q. You see the third sentence there, I don't need to read that again?

A. I am still trying to find it. There is no treatment required...

Q. Under No Treatment Required, the third paragraph:

"Selection of this option is based on operational restrictions or evaluations which indicate there are insufficient quantities or types of competing vegetation to warrant control."

A. Yes.

Q. My question is: Are there not circumstances where non-timber values might also lead to the selection of this option?

A. I think that that option -- what we are saying here is there is no retreatment required from the silvicultural standpoint of the crop tree species.

I think what you are saying if, for example, the areas should not be sprayed or tended in any manner because we need moose browse there, that doesn't mean there is no treatment required, that means there is no treatment allowed on that. The treatment may be required from a silvicultural point of view, but is not because of other values there that override that.

Q. Okay. I guess I go back to what I was speaking to before, it depends very much on when the decision has been made in terms of the structure of the forest in time and space, whether that would be for

timber values or non-timber values?

A. Yes, but I think it is important to know at the five-year planning stage that this area is required for moose browse or certain amounts so that a manager doesn't apply a silvicultural prescription for that area or regeneration prescription for that area without knowing that he can or cannot tend it.

If there is no tending required, the choice may be different for the manager at the time of the cut-over to not, for example, plant that area knowing that he is going to tend it and can't tend it. The option may be different.

Q. This is the theme that Industry has come forward with on many occasions, you can't disentangle harvest, site preparation and planting and tending, they are all a continuum. That's what you are telling me?

A. Yes.

Q. Dr. McCormack, there are a couple of matters I would like to get clarified on manual tending and I would like to turn first to page 78.

I am looking here at the first full paragraph and you are indicating here that one of disadvantages on manual tending is that young seedlings are suddenly exposed to sunlight and as a result are

sometimes not able to adapt to new conditions; correct?

DR. McCORMACK: A. Correct, yes.

Q. What struck me when I read that is I didn't understand why that would be the case with manual tending, not with herbicide release. Are you not seeing the same phenomenon occurring with herbicide release?

A. They occur at different levels at different rates. The difference being when manual tending takes place the overtopping or shading vegetation is removed in an instance and dropped to the ground. So, if you will, sunlight comes in immediately; in contrast to a herbicide tending treatment whereby first the foliage is reduced, it does not happen all at once and, in many cases, all foliage does not leave the crown of the treated competing species at any time; sometimes actually portions of the foliage remain on the crowns of the treated trees, then over time the crowns which have been treated break up, fall piece by piece to the ground, and gradually open up the stand falling in place. So there is a distinct contrast there between the two.

Q. Can we turn to page 79, please. This is under Treatment Efficacy, the second paragraph, the second sentence, it indicates:

"On productive sites where competition is severe, retreatment of manually released areas is always needed unless an effective chemical treatment is applied to cut stubble during the initial entry."

Now, why is this the case? Why do you need to retreat?

A. Why do you need to retreat? Retreatment is necessary because of what could be described as the rebounding of the treated competitive vegetation.

For silvical characteristic reasons which I described earlier in my evidence-in-chief, the vegetation which is commonly -- the species which are commonly competitors have a capability for regrowth, resprouting.

It varies by species, but often resprouting from roots or resprouting from stumps and so forth to come back in greater quantities of stems at more rapid growth rates than were there at the time of the initial treatment. Sometimes this regrowth can occur within the first growing season after treatment.

So when you -- with the more rapid growth rate you actually can end up with a higher amount of biomass present in the above ground portion of the

competing vegetation, that you have gained very little in terms of assisting the crops trees in achieving a free to grow position. Because of that, it is usually necessary to retreat to reduce that rebounded, if you will, competing vegetation.

Q. So the reason that this is less efficient or less effective than chemical treatment is the chemical treatments, and particularly chemicals like glyphosate, are able to kill the root system and thus prevent suckering and sprouting to a large extent?

A. There is sufficient suppression, in some cases of individual plants killing of the root systems so that this rapid resprouting does not occur. Resprouting does occur, but not as rapidly as when manual treatments are applied.

Q. Is 2,4-D as effective in reducing resprouting as glyphosate or is it less so?

A. For some species it is less effective than glyphosate.

Q. For what species is it more effective?

A. There are a few species where it might be considered equally effective, if one is looking at resprouting of woody vegetation.

Q. For example?

A. Alder, pin cherry, when properly applied, aspen.

Q. Aspen?

A. If properly applied.

Q. What do you mean by properly applied?

A. Proper prescription of rate of active ingredient applied effectively at a proper time from a phenological standpoint.

Q. So what you're saying is that has to be done if you were interested in, say, maintaining a certain level of sprouting and suckering it's a fairly subtle science that has to be done carefully?

A. It's subtle but it's not that difficult to administer.

Q. I would like to turn page 90 of the witness statement. I believe you are dealing here with a study by two Canadian Forestry Service authors, Malik and Vanden Born; correct?

MADAM CHAIR: What page is that, Mr. Hanna?

MR. HANNA: Page 90.

MADAM CHAIR: Thank you.

MR. HANNA: Q. In the middle of the page.

DR. McCORMACK: A. The reference to

Malik and Vanden Born is not so much to a study but a summary of studies and information that relates to the subject at hand.

Q. It gives a bibliographic review of the various papers and studies. It wasn't primary data itself; was it?

A. No. They were not conducting the research. I don't have a copy of the publication in front of me but, as I recall, they are summarizing work of several other scientists. It is not original work of their own.

Q. Do you know if much of their study, if not all, was dealing primarily with 2,4-D and chemicals other than glyphosate?

A. I can't recall that right off the top of my head, I'm sorry. I would need to take a quick look at the copy of the publication. I do not have a copy with me.

Q. That's not critical. The date however was 1986 and glyphosate was approved for use at least in Canada in 1984, so there wasn't much time for them to put together a bibliographic summary for studies done prior to that time?

A. Well, except for the fact that they did review literature from other areas, including some

in the United States, and glyphosate had been under test in forestry situations - though I do not recall what they might have reviewed in this case - since 1973.

So there are data in the literature and forestry applications of glyphosate since 1973 and at that time there were several thousand references in the literature from the agricultural and crop community.

Q. Okay. Well, let's deal then with just the Carter paper which is -- I think this is a direct quote from Malik and Vanden Born; is that correct, the indented section here, Carter et al?

A. Yes, this is a quote from Carter, et al, it says here in 1975. I'm not sure that date is correct, depending on the specific paper being cited, I guess. But it is, as indicated here, it is a quote from Carter and I know in the early 70s Dr. Carter was at Auburn which is in Alabama and in cooperation with Industry co-operators he was conducting work that relates to the quote stated here.

Q. Can you confirm for me that the studies that Dr. Carter undertook dealt with 2,4-D applications and not glyphosate?

A. As I recall they dealt with phenoxy, herbicides and maybe one or two others which were

available at that time, but they did not include glyphosate, to the best of my recollection, though...

Q. Well, Dr. McCormack, we are going to -- I will be introducing Dr. Carter's paper later.

A. Yes, I know you have a copy of at least one of Dr. Carter's papers.

Q. And we can talk about it in detail at that time?

A. Fine.

Q. What I'm interested in knowing is: You have put here in emphasis, in italics, the quote from Dr. Carter, and I would like to get your interpretation of the statement here that:

"Wildlife habitat was more diverse on chemically prepared sites."

What's your interpretation of more diverse in this context?

A. This is with reference to vegetation species and I think some references to structure figure in here because, as I recall, the herbicide alternative in some of the studies conducted by Dr. Carter allowed for leaving some standing trees on the site rather than a mechanical treatment which kind of chopped everything down to the ground.

Q. And why did you decide to add

emphasis to this particular statement?

A. I think the major reason here was to emphasize the reference to diversity which is in keeping with subsequent research work carried out in forest situations with herbicides studied by Dr. Carter, but also herbicides which have come into use since this publication by Dr. Carter.

We are dealing here with basic effects of treatments, to some extent they go across -- cover a variety of chemical approaches to carrying out site preparation.

Q. Would it be a proper interpretation of this then that the reason you put emphasis on the statement is that this is general rule that you would expect in Ontario also?

A. It's a general rule in the opinion of forest weed scientists across forest vegetation situations across the forest regions of North America.

Q. That you expect wildlife habitat to be more diverse on chemically prepared sites than on mechanically prepared sites?

A. In a general way, depending of course on the actual characteristics of the mechanical treatment. There are a variety of mechanical treatments even beyond those considered by Dr. Carter.

So this is intended in the general sense, but if one wants to deal with specifics, we would have to be more specific in defining mechanical treatment and the extent of that mechanical treatment across a site.

Q. And similarly, the chemical treatment in terms of the nature of the chemical and its application rate?

A. Of course.

Q. Now, the second part of that quote indicates that:

"Depending on specific sites, herbicide applications may modify wildlife habitat toward favored food species."

Would you also agree that in some circumstances herbicide applications may modify wildlife habitat away from favored food species; it can go both ways?

A. I suppose that is a possibility, yes.

Q. And in order to determine whether the effect will be positive or negative, one thing you would want to look at is the specific site and the circumstances under which the herbicide application is proposed; would you agree?

A. Do you include the vegetation present in a consideration of the spectrum of activity of

herbicides of choice in that description? If so, then I agree.

Q. Yes, I'm happy to add that. At the time that Newton prepared this quote glyphosate was not used operationally in forestry; was it?

A. No, it was not.

MS. CRONK: I'm sorry, which quote?

MR. HANNA: The quote on page 90.

MS. CRONK: In the witness statement?

MR. HANNA: In the middle part, Newton 1975.

MS. CRONK: Thank you.

DR. McCORMACK: We're still dealing here with an extract from Carter et al and Newton's publication as presented by Malik and Vanden Born?

MR. HANNA: Q. Correct. And we will also be talking about the Newton paper shortly.

A. Yes, I understand.

Q. Now, you would agree with me that there is a relationship between the amount of suppression that is accomplished and the amount of response in terms of growth of conifers within a certain range, there's a limit, but within a certain range you can --

A. Our evidence contained in this

document indicates just that.

Q. And one way to increase the yield from the land base in terms of wood fiber would be to increase the intensity of suppression in some sites, to a degree?

A. Recognizing that this level of suppression varies across the variety of vegetation on site.

Q. Right. Another alternative would be to practice tending more extensively; to increase the wood supply we could practice tending more extensively?

A. I guess that gets into wood supply and when you start describing extensively, I'm not prepared to address that part of the question within the area of the undertaking because it would need some definition of extensive and I'm not familiar with the other management implications that might come into play when one takes that type of an approach.

Q. That's fair, Dr. McCormack. Dr. McCormack, I would like now to deal with the Carter paper.

MR. HANNA: Madam Chair, I would like to introduce this as an exhibit. It's a paper entitled: Impact of Chemical and Mechanical Site Preparation on Wildlife Habitat, the authors are Carter, Martin,

Kennamer and Causey. It was published in 1975. It's from the proceedings of the Fourth North American Forest Soils Conference held at Laval University, Quebec in 1983.

DR. McCORMACK: If I may, 1973.

MR. HANNA: I'm sorry. Did I say '83? Excuse me, Dr. McCormack.

MADAM CHAIR: That will be Exhibit 1200.

---EXHIBIT NO. 1200: Paper entitled: Impact of Chemical and Mechanical Site Preparation on Wildlife Habitat, by Carter, Martin, Kennamer and Causey, 1975 from the proceedings of the Fourth North American Forest Soils Conference, Laval University, Quebec, 1983.

MS. CRONK: They do not have a copy. They do not, Dr. McCormack.

MR. HANNA: Do you want a copy? (handed)

MS. CRONK: Yes. Thank you.

MR. HANNA: Madam Chair, I didn't get the exhibit number for that.

MADAM CHAIR: Exhibit No. 1200.

MR. HANNA: Q. Now, I had asked you a question before, Dr. McCormack, whether this article dealt primarily with phenoxy herbicides. Can you confirm for me now that that is the case?

DR. McCORMACK: A. It deals principally

with the herbicides 2,4,5-T, and Tordon 101.

Q. Yes, Tordon also deals with 2,4,5-D; does it not?

A. Yes, with the -- that's inherent in mentioning Tordon 101. Tordon 101 is a mixture type product which includes the active ingredient 2,4-D and picloram.

Q. And it does not deal with glyphosate?

A. No, it does not. As I have reviewed the publication, it deals with only 2,4,5-T and Tordon 101 which includes 2,4-D and picloram. I state it that way because 2,4-D or picloram are not used as treatments alone.

Q. Yes.

A. They're in a mixture.

Q. Yes. I would like to turn to page 324 of the exhibit and the first sentence there in the first full paragraph which says:

"But most discussions on the environmental impact of 2,4,5-T have neglected any reference to the effects of this herbicide or alternate treatments on the vegetational composition of the resulting forest."

Would you agree that this statement is

true today with respect to 2,4-D, glyphosate and many other chemical and mechanical tending methods?

A. I would like to read the sentence through, please.

Q. Sure.

A. I don't think that's true of glyphosate today, if one substitutes glyphosate for 2,4,5-T in that sentence.

Q. Okay. So I take it then that I can go somewhere and find studies that have predicted, for example, within the area of the undertaking the impact or the effects of glyphosate or alternate treatments on the vegetational composition of the resulting forest in time and space?

A. I think for species which commonly occur across the area of the undertaking there is information that relates the interactions between glyphosate and those species that would indicate their potential for being components of the stand that develops subsequent to a glyphosate treatment.

Q. I just want to make sure we are talking about the same thing here, Dr. McCormack. Are you suggesting then that there have been successional analyses of stands that have been treated with glyphosate and looked at over, say a long period of

time, 20 or 30 years, what the implications are in terms of vegetational composition?

A. Certainly not for 20 to 30 years because, as I've indicated, glyphosate was first applied in a forest situation to the best of my knowledge in 1973. Since that is when the active ingredient first became available to researchers in forestry, I doubt if there is anything that would be in place before that.

However, plots established in those early years, meaning 1973 to, say, middle 70s, are or have been evaluated over time and in some cases still being visited by researchers who put them in place. So at least for the time period where glyphosate has been a consideration in the forest ecosystem, this question has been addressed.

From that I think one can gain enough information to project the vegetation development over a longer period of time. So in this statement where it says, "...effects of this herbicide on the vegetational composition of the resulting forest...", that we do have information that addresses that.

Q. Where would I find reference to that information in your witness statement, Dr. McCormack?

A. I guess I would have to review the

witness statement in some detail--

Q. But Dr. McCormack --

A. --to specify exact points but - this would require a little time on my part to be specific - but since in putting this together, being familiar with a large volume of literature on glyphosate and its effects, that the knowledge and thinking that comes from that literature is certainly incorporated throughout the discussion here that relates to glyphosate.

Q. Yes, I appreciate that. The reason I asked that of you is: Accepting for the time being that we have developed that understanding at least on those -- I don't think there is a lot of sites, but at least on those sites that we have undertaken that monitoring, that we have some understanding of the successional pattern that's taking place on those sites.

Now, if we were to use that information in future timber management planning in this province it's important that that information is made available.

I think I've read fairly carefully your witness statement and I don't know where in that witness statement I would go to to say: Here is a successional sequence that we can anticipate on

different sites when we apply glyphosate at different rates and at different times in the forest development. And that's very important, if we can do that, that's a very important thing.

And so that's why I ask you where that might be in your witness statement, or where I might find that.

A. I understand your concern, Mr. Hanna, but I must point out that it was not the purpose of this witness statement to go into the details of succession or vegetation dynamics in detail, species by species, that might follow a treatment of any of the active ingredients described here.

For that reason, I think to be specific one would have to go outside the witness statement, because you are starting to deal with more detailed science in terms of species names and plot designs and so forth that in putting this information together we felt was beyond the need of the witness statement, so one would have to do as I described, and certainly would include some of the work that was initiated by Dr. Campbell in Ontario and plot work by Lehela, where species composition, numbers of species, a very detailed identification of the species present were carried out.

And this goes back to what I put into, at least in my thinking, some of the earlier forest applications for research purposes of glyphosate, and it goes on from there. If we consider species within the area of the undertaking and related situations, but you start to get into some specific sciences, I'm sure you recognize.

Q. So what you're saying is the science is there, you have to draw the line somewhere in your witness statement, you said simply open the door and said the science is there, but you haven't laid it all out on the table at this point, but it could be done?

A. I think it was beyond what we considered reasonable in terms of carrying out a scientific literature standard of literature review for this statement of evidence.

Q. Okay, Then from the point of view of the manager at some point down the road who is attempting to look at those successional changes, it would be your opinion that that sort of projection is possible given the understanding you have at the present time with respect to glyphosate?

A. Not only possible but likely, since this type of information has been conveyed and I suspect will continue to be conveyed in a variety of

special workshops and training sessions that are carried out, that I'm personally familiar with, from Ontario right on across eastern Canada and the United States, where the purpose is to put in the hands of managers or potential managers things like species lists, reference lists, indications of where they can go for the type of information that we are discussing.

So that, as I point out, reference lists bibliographies, annotated bibliographies and such are being made available to forest managers.

Q. And you see that as a key to responsible management; having that knowledge?

A. Yes, and I point out that there have been definite efforts carried out to accomplish that.

Q. Do your comments in terms of our understanding of the vegetational composition of the resulting forest, do they apply also to, for example, 2,4-D? Do we have a similar level of understanding?

A. Well, 2,4-D is probably the most and longest studied of any such materials. It was first applied in the forest, of which I'm aware, in areas that would be typical species within the area of the undertaking since 1947.

Q. Good, okay. Can we move on then to the --

MADAM CHAIR: Can we have lunch now, Mr. Hanna? Is this a convenient time to break?

MR. HANNA: I couldn't say no, Madam Chair. Certainly, this is fine.

MADAM CHAIR: How are we doing with your cross-examination?

MR. HANNA: I bogged down a bit there after the morning break, probably more because of my ineptitude than anything else, but it looks now that I may be able to finish shortly after the afternoon break.

MADAM CHAIR: The afternoon break. So you think it will take an hour and a bit to finish.

MR. HANNA: Is that how long I have to the afternoon break? I was thinking about an hour and a half, two hours to finish at this time.

MADAM CHAIR: You've always had great success at lunch and breaks going through with your pencil to see if you could speed that up.

MR. HANNA: It's a problem, I'll tell you, I have sort of a record, Madam Chair. I will do my best.

MADAM CHAIR: Thank you very much, Mr. Hanna.

We will be back at 1:35.

---Luncheon recess taken at 12:05 p.m.

---On resuming at 12:40 p.m.

MADAM CHAIR: Please be seated.

MR. HANNA: Madam Chair, I was able to read over my remaining questions in 15 minutes, so if I give ample time of opportunity for Dr. McCormack to respond and I don't think of any supplementaries we should be able to be finished in good course this afternoon.

I won't say how many questions it was, though, that I was able to read in 15 minutes.

MS. SEABORN: It depends how fast you read.

MADAM CHAIR: Are you a fast reader, Mr. Hanna?

MR. HANNA: I will leave that for the record to show.

Q. Dr. McCormack, we were dealing with Exhibit 1200 and I would like to continue with that and turn to page 324. I am looking here at the sentence just before Current Trends in Site Preparation, that paragraph above that, in the first sentence where it says:

"The forest land manager is currently faced with the problem of increasing

the supply of wood fiber while, at the same time, maintaining as diverse a vegetational habitat as possible."

Would you agree that the same challenge faces forest managers today?

DR. McCORMACK: A. Yes, I do.

Q. And in order to deal with this challenge, one is faced with balancing these two demands and one must balance these demands in time and space at an appropriate scale. Would you agree?

A. I agree.

Q. Keep going like this it may be half an hour.

A. I wanted to read it again. I don't mean to tie up time, but...

Q. No, I was complementary not derogatory. I'm sorry, Dr. McCormack, if you interpreted it otherwise.

This paper, it examines tree injections versus mechanical site preparation, No. 1; it also examines aerial spraying versus mechanical site preparation, 2; and, 3, it reviews a comparison of aerial spraying treatments; is that correct?

I think there is three headings of that nature in the paper?

A. There are several combinations here that -- I'm not sure you mentioned burning.

Q. I'm sorry, tree injection combined with burning.

A. Burning is also involved here in the combination treatments, yes.

Q. I want to deal with those individually. With respect to tree injection versus mechanical site preparation, and that is discussed starting at page 327, the authors found that the long range potential for a diversified habitat was better on the injected and burn site; is that correct?

I can refer you specifically to the last paragraph there on page 327, the first sentence.

A. Yes, I see that. I was also looking at the table. Yes, they defined diversified habitat in their work, yes.

Q. And they define the diversified habitat in terms of the structure of the forest, the vertical structure of the forest and in terms of the abundance of other species other than just the commercial trees; is that correct?

A. Yes.

Q. And one of the reasons they found the diversified habitat was better on these sites was that

they found that there was greater competition and they concluded that this could result in reduced pine needles; is that correct?

A. Can you refer me to where that is stated specifically?

Q. Yes. It's continuing on at the bottom of that page -- actually, that whole paragraph at the bottom of page 327, carrying over to the top of page 328.

A. Okay. In terms of their use of -- where they say:

"But from the standpoint of timber production, the prognosis for the mechanically prepared area is better.

Q. And I'm presuming that they're meaning there that the yields in fact later on -- actually, the next sentence they talk about reduced pine needles?

A. These are their conclusions from their work.

Q. Now, in the case that they examined here, can you confirm for me that - with this particular set of studies that they undertook - the overstory that they dealt with was taller than three metres, in fact it was quite a large stand -- quite

large vegetation they were dealing with?

A. They make reference to larger overstory trees and they talk here - and I don't recall exactly where - but with regard to some of the species, I think it needs to be noted here that the crop species in question I think is loblolly pine and we are dealing with other species which are native to Alabama, so we are looking at a group of species that certainly are not typical of the area of the undertaking.

Q. Well, let me ask this question. I certainly appreciate what you're saying. If we were to go into, say, a poplar stand with an understory of white spruce in the area of the undertaking and to undertake tree injection with 2,4-D, as I think they are they are using -- excuse me, I don't know if it was Tordon or 2,4-D, 2,4,5-T, one of the phenoxy herbicides, and to repeat this experiment, similar to what they found here, would you expect similar results?

A. They could be similar. I would offer that 2,4-D is a possible option of treatment in this case for the area of the undertaking.

Q. And where we have closed overstory of relatively large trees, it's a well-known fact, is it not, that when we open up that overstory by whatever means we can increase the available browse?

A. That is a possibility, depending of course on the other characteristics of the site.

Q. Right. Whether the understory will respond?

A. And what species are present, yes.

Q. I'd like now to look at the comparison between aerial spraying and mechanical site preparation which is on page 328 -- or it starts on page 328. At the top of page 329, they state:

"...the data do not clearly reflect the differences in the vigor of competition, which was much greater on the aerial spray and burned plots."

Would you agree that one of the reasons for the competition was the fact that they were using 2,4-D and 2,4,5-T and not glyphosate?

A. The aerial spray treatments, I think we still have to point out it was 2,4,5-T and where 2,4-D was used it was used in combination with picloram as the Tordon 101 mixture.

With reference to the statement to which you've just referred relating to vigor of the competition, I would attribute at least some of that vigor, if not most of it, to the fact that those plots were burned following the spraying.

Q. I would like to turn now to the conclusion an page 331. I'm looking at the second paragraph there, the third sentence. It says:

"If regeneration areas are well interspersed with mature stands, and if stand rotation length is sufficient to allow resprouts to reach mast-bearing age, the long-term effects of site preparation on wildlife habitat should not be detrimental."

Do you see that?

A. I have it, yes.

Q. Accepting that this is loblolly pine and we don't have too much loblolly pine in the area of the undertaking, would you feel, as a general statement, that if we can assure good interspersion of mature stands with stands regenerating that this would be a key consideration in the area of the undertaking also in terms of chemical tending, the same principle?

A. I guess interspersion is a fairly general term here and it could describe any number of possible situations, some of which might be desirable and some of which might be undesirable, or at least very difficult to handle from the standpoint of management or managing the vegetation present. So I

have a little difficulty...

Q. As a generic consideration and something to be considered in terms of the specifics, it's something you would have to deal with on a specific case?

A. I agree with that, and also the qualification of where limited in terms of these authors referring to mast-bearing age and that we are not that involved in the area of the undertaking with mast-bearing species.

Q. I think what you're suggesting there is that moose are not dependent on mast in the same way that deer might be in a southern forest; is that what you're suggesting?

A. If we had species which were known producers of mast -- I don't know if this term mast has come up in the proceedings, but in this case the authors are considering acorns as the fruit of the oak trees present on the site and the term for those acorns is mast.

MADAM CHAIR: The acorns are referred to as mast?

DR. McCORMACK: Mast, m-a-s-t, is the common term for that type of a yield from such trees, nut crop type.

MR. HANNA: Q. When we do produce nuts in the -- I can't say it. We have nuts all over.

We do produce seeds in the area of the undertaking and they may not be important in terms of ungulates, but they are important in terms of other forest wildlife, so the same principle in a general way holds, but not specifically with respect to acorn?

A. (nodding affirmatively)

Q. Dr. McCormack, I would like to now deal with a document that I think you are more familiar with and that is Exhibit 722 which is the paper of which you are an author entitled Browse Availability After Conifer Release in Maine's Spruce Fir Forests.

A. I have a copy.

Q. Now, I just want to make sure I understand the setting of this study clearly.

MS. CRONK: That's 722?

MR. HANNA: Yes.

MADAM CHAIR: Which exhibit is that, Mr. Hanna?

MR. HANNA: 722, Madam Chair.

MADAM CHAIR: Thank you.

MR. HANNA: Q. Now, this study area was harvested by clearcut in the winter of 1969/70; correct?

DR. McCORMACK: A. I want to check the exact year if it's stated here. It would have been...

Q. It is stated on page 644--

A. It would have been the late 70s.

Q. --the right-hand column, top of the page.

A. Yes. And that record comes directly from our records.

Q. Now, I didn't see any mention in the paper of whether or not there was any replanting of conifer stock?

A. There was no replanting whatsoever.

Q. Was there any site preparation?

A. There was no site preparation.

Q. Now, various herbicides were applied to the site in August, 1977 at various loading rates; is that correct?

A. Yes, it was -- as I presented before the Board on Monday the 4th of August, 1977, with a series of treatments which are summarized in Exhibit 722 in Table 2 listing, as you point out, Mr. Hanna, for the most part, two rates of active ingredient for each active ingredient tested.

Q. And the ones I am particularly interested in are glyphosate and 2,4-D.

A. Okay. Then in this case we have two rates of glyphosate as what was then -- what was later known as the product Roundup. 2,4-D only was applied in combination, in combination with triclopyr and also in combination with 2,4,5-T.

Q. Right.

A. One other treatment that was not considered in this study is not listed here.

Q. Now, something I didn't note in the paper, and perhaps you can just briefly inform the Board, is I didn't see any description of the site characteristics of the study area; in other words, was the site wet, dry, rich, poor, flat, rolling?

Can you just briefly tell us what the site was like?

A. The site was flat to very gently rolling, there were rocks of anything from baseball to softball size, maybe larger, scattered across the site, it is what we would put in a medium range of site quality, not outstandingly high but also not distinctly at the low end. In terms of drainage, it would have been at the lower end, not poorly drained but...

Q. A moist site?

A. A moist site, but adequate drainage to support good vegetation growth, where drainage is an

important consideration. And as indicated in here and as I have described for the Board, and unfortunately, Mr. Hanna, I showed a variety of slides of the study site at the time of treatment and following treatment, and you would have seen -- well, many of the species that are listed here, but a good cross-section of fairly heavy vegetation across the site.

Q. I would have like to have been here in all honesty, Dr. McCormack, but all of us have constraints on us.

A. I understand.

Q. Now, the other thing I didn't see in the paper was a description of the nature of the overstory vegetation immediately prior to herbicide application. Is there a quantitative description anywhere here as to what the overstory vegetation consisted of?

There is a list I believe in Table 1 of the species present, but it didn't -- actually it isn't even the species present, it's browse species. I didn't see any sort of quantitative description of the nature of the stand.

A. There are indications of per cent deciduous cover in Table 4, but there is no detailed description of the overstory because the overstory was,

in those kinds of terms, not what we would describe as a true overstory condition.

It was seven years following harvest at the time of treatment, there was the wide variety of vegetation, which I have described, but much of this was ranging from, say, one metre to three metres in height and had not developed strong independent crown structure supported by an obvious stem. Most of that vegetation was fairly well foliated down most of the length of the stem; consequently, it was a stocking of vegetation rather than distinguishing overstory from anything that was in the understory.

Q. A significant portion of the vegetation, the woody vegetation was greater than 2.5 metres tall, though; was it not?

A. It was up into three metres, some of the taller aspen may be approaching four metres and then there were occasional residual trees which we would term as buggy whips, fairly narrow stemmed, small crown that had remained alive but not very functional following harvest scattered across the site, but not enough to constitute what would be term an overstory. Most of those were scattered birch trees and aspen trees with an occasion maple.

Q. I got the sense in reading this paper

paper that we had a stand that was quite closed in terms of quite dense in terms of the vegetation and that the overstory was at the point that it was starting to close in and shade out the understory vegetation?

A. The area was well covered with vegetation in a general way. The species present, which were considered potential crop species, those being spruces, balsam fir, white pine, principally were at a point where, in my judgment, another two years or more they would have been deteriorating and an option of releasing them was getting pretty slim.

Q. Yes. Now, another thing that I didn't see in the paper was the stocking of conifer prior to the herbicide applications and following the herbicide application during the remeasurement in 1985. Is it in the paper and I've missed it?

A. These data are not in the paper in detail. I can only refer to the conditions which were there in terms of validity of what is presented in this paper.

If you look at Figure 1 on pge 645, you see a diagram showing a layout of the rectangular blocks which were the treated plots or I tend to refer to them as blocks. Each one represents, for the most

part, except where indicated, four passes of the helicopter which applied the treatments.

The reasons those blocks are distributed the way they were is that something on the order of 30 people days of running transects studying the stocking levels of the potential crop trees and the characteristics of the deciduous vegetation allowed us to evaluate those transects and place these blocks, as you see in the diagram, in a manner that they were as uniform as possible before the treatments were applied.

That's an important consideration in conducting a study of this type and often is not possible, but with that labour effort we were able to carry it out. So I offer that as a partial response to your question. All blocks were relatively equal at the time of treatment.

Q. Can you give just some indication, though, of the stocking? The reason I ask the question is the level - and we will be coming to this in a minute - the level of conifer stocking can effect the response of the browse; can it not?

In fact, I think you go on and talk about that in our -- .

A. Depending on how they respond to the release?

Q. Yes.

A. Well, I would rate it as well stocked and uniformly stocked. Referring back to the harvesting system, it was conducted during winter, which is advantageous when you have regeneration of the type present on the site. It had some protection because of the snow cover.

Q. So we are talking in the order of a thousand stems per hectare, 2,500 stems per hectare?

A. It was a high number.

Q. Again, I'm not going to hold you to it, you know, a it strict number, but just an appreciation?

A. Well, into thousands per hectare.

Q. Okay. Now, on page 646 you indicate that -- I'm looking in the right-hand column about the middle, it says:

"...the higher rate of glyphosate treatment which reduced non-coniferous cover the most and caused some conifer damage..."

This is supporting the matter that we were talking about before, that the intensity of the treatment can affect the results in terms of the effect on the competing vegetation?

A. Yes. This one, the high rate of glyphosate, keep in mind here, Mr. Hanna, these treatments were originally applied in some of the early work prior to registration of glyphosate where we were evaluating the spectrum of control of vegetation responses, we were not sure what the most applicable or appropriate rates would be.

This rate now exceeds the rate used in any forestry treatment anywhere that I am aware of at this time using glyphosate herbicides, and I would also further qualify the conifer injury occurred on balsam fir which was susceptible to that level of glyphosate, but did not occur on the spruce.

Q. I'm going to ask -- put this question out to the panel, I am not sure who it should go to. Can any of the members of the panel - because this question deals with the area of the undertaking, Dr. McCormack, I am going to ask somebody else - provide me the highest application rate of glyphosate currently permitted in the area of the undertaking?

MR. STANCLIK: A. Six litres per hectare which is 2.14 kilograms of active ingredient per hectare.

Q. Now, Mr. Stanclik, the application rate, for example, with glyphosate, is it specified in

the timber management plan?

A. I don't believe so.

Q. So there is a range of concentrations that could be applied?

A. That's correct.

Q. Is it your experience, and any other members of the panel wish to add, that the concentration is varied according to the nature of the site on a regular basis?

A. It has been varied by my company.

Q. And you do this on a routine basis?

A. I wouldn't say on a routine basis, but we have varied it from year to year and site to site.

Q. Do any other members of the panel have anything to add on that?

(no response)

Silence says no.

MR. TOMCHICK: A. We use the appropriate rate according to the site conditions, so we do vary the rate within the label range.

Q. So you make that decision on a case-by-case basis?

A. Yes.

Q. And at what point in the process, Mr.

Stanclik or Mr. Tomchick, is the application rate specified?

MR. STANCLIK: A. We specify -- For a particular block or for the project?

Q. I am willing to start in the timber management plan and go down anywhere from there.

A. Okay. We normally specify rates to give the MNR an indication at the annual work schedule level. We are required to specify it on the Form 5 in the spring to be submitted to MOE.

Q. But it's normally shown in the annual work schedule as a general rule of practice?

A. I don't know if it's a general rule of practice.

Q. But with your company?

A. Yes.

Q. Dr. McCormack, I would like to go back here to the statement continuing on in that paragraph on page 646, the remainder of that sentence, about the high glyphosate treatment. It says:

"...reduced browse availability by 57 per cent soon after treatment, yet 1.5 years after the treatment available browse on those plots was still comparable to that in the control plots."

DR. McCORMACK: A. Yes.

Q. Would you expect this to be the case if the treatment had occurred, instead of seven years after the cut, three to four years after the cut?

A. There might be subtle differences, but in a general way I would expect at least a similar response.

I think what you are referring to here is, first, the reduction in browse depending on how much browse in that sort of time after plant. If we are talking about a situation after harvest of, I think you said, three years, it might be a little different, but in terms of the recovery comparable to an adjacent untreated area, I would expect it to be generally the same.

Q. The reason I ask that question is one of the things that I interpreted from this, and perhaps I shouldn't have, is that this particular stand was at the point that the browse was just going out of reach of many of the species that would use that browse.

A. Portions of it did have stems that were right at the level you have described.

Q. Right. So if you wait a couple of years in the control, regardless of what it had done, the browse will decline in the stand because of the

evolution of the stand?

That wouldn't be the case if the stand were younger and the browse -- the window of browse were greater?

A. That's a possibility, yes.

Q. Later, just below that sentence -- two sentences below that, you say:

"The herbicides 2,4-D and 2,4,5-T left abundant low cover and some recovering vegetation greater than 1.5 metres tall."

Is it fair to conclude, then, in this case you found these phenoxy herbicides had a less detrimental effect on browse production than glyphosate?

A. At that point, in terms of looking at period of time following treatment, we are now starting to look at development over time and that statement refers to a shorter time period following the treatment, and that was the case with the basic phenoxy treatments.

Q. I would like to turn now to page 647 and I'm looking at the -- under Management Implications, the right-hand column at the top, it says:

"In some areas, therefore, conifer growth

and the period of browse availability would be maximized by early release with herbicides followed by precommercial thinning (spacing)."

A. Yes.

Q. Now, you indicate here that the period of browse availability would be maximized by this management regime you've described. Would the quantity of browse also be maximized by this management regime?

A. I think our observations since these date were gathered would substantiate that. What happened in this case, almost immediately following the collection of these data, was that half of each block was precommercially thinned as part of the operational procedure of the land owner.

We have now had, I lose track of time, but something on the order of three plus years to observe this area since the precommercial thinning. What has happened is I think what could be termed a mixed stand, though with many of the conifers clearly in a dominant position in developing.

So what we are observing with the precommercial thinnnig activity is that there has been in fact been an extended period of available browse

material and actually it's growing pretty well.

Q. So if your objective was to maximize browse availability and the period availabilty, would you agree that the applications that you've described here around the seven year period using phenoxy herbicides and spacing would be the preferred treatments, if that was the objective?

A. Oh, I have some reservations about that looking at the amount of the browse material that developed into the seventh, eighth and ninth years because looking at Table 3, there are some indications there that there are some other options.

Looking at glyphosate and triclopyr in particular, that there was a possibility to gain a superior crop tree response, especially among some of the spruce trees, with at least equivalent amounts of browse material present. So that we still have extended the browse availability but, at the same time, have secured better responses in the crop trees.

Because of that, and knowing that 2,4,5-T is no longer available to us and 2,4-D alone would not give these results - keep in mind here that 2,4-D has has only been used in combinations - that that particular option is not available today. So it's a difficult one to address.

Following that with thinning, there one starts to get into some other management decision-making steps that I think I should not offer because that becomes a decision on the part of the manager and the role, if any, of precommercial thinning in the area of the undertaking.

So we can discuss that in terms of the study site and in kind of an academic sense, but I would not want to relate this directly to that practice in the area of the undertaking. I would have to leave that up to the Industry representatives here on the panel.

Q. What you are saying, if I understand, is that in order to address these questions again, it is a site-specific issue and you have to look at the site and what it is you're trying to achieve and set out what you're trying to achieve clearly and then pick the right tool; is that --

A. That's my understanding of vegetation dynamics, and in your question you pose a treatment which is not available to any of us in any jurisdiction.

Q. Yes, but I was talking specifically about this site if I was interested in maximizing it, but I will accept your answer as you've given it to me.

Would a wider spacing of the conifer cover have provided a longer period or a more abundant availability of browse?

A. In my judgment, observing what has taken place since the thinning operation, no. I think there is ample browse material present on the site.

Q. Would you agree with that if the stocking had been substantially higher for conifer species? Would there be a conifer stocking level that that would not be the case?

A. Well, with the -- you are referring to before precommercial thinning?

Q. No, I'm referring now to that site. If I was able to increase the stocking of conifer substantially over what it is now, could that affect the availability of browse?

A. I guess I'm not clear on the question because the existing conifer regeneration was thinned to a fairly basic prescribed spacing standard that is maintained by the land owner and regardless of how many stems had been there, we would have ended up with a similar result either way.

Q. I'm looking at, again, your management implications discussion on page 647 where you talk about, I guess, three spacings and you

describe the implications of each of the three spacings. It says:

"The widest spacing would have the least interim conifer cover, would probably provide the longest period of browse production, the largest crop trees and good thermal cover."

Are you suggesting that you'd change that conclusion now that you know what --

A. No, not at all, now I have a better understanding of your question.

Q. Fine.

A. This is speculative to the point of observing different conditions on other sites that provided some background, but the spacing on this particular study site was a fixed spacing, so there was no comparison of different spacings on the study site and these data were collected prior to that time.

That statement is based on observations on other areas that had received similar treatments and where there were different spacings of crop trees and we could observe the vegetation response.

Q. So given what you see on this site now, even beyond what is reported in this paper, you would still stand by the statements that are indicated

here in terms of -- in a general principle, the implications of spacing in terms of browse?

A. I would tend now with my observations on this site since the spacing treatment to -- I would want to moderate that 2 by 2 metre site because I don't think we would see that much reduction in the browse availability.

Frankly, I am impressed by the amount of browse which is available and the browsing activity that we observed on the site since the pre-commercial thing.

Q. And based upon the understanding that you do have of the undertaking, are you suggesting that this is a conclusion that you would expect to find generally over the area of the undertaking?

A. Yes.

Q. I would like now to deal with one last thing on this paper, and that's in the second -- or the latter part of the Management Implications on page 648.

I'm looking on the left-hand column, the second paragraph from the bottom. And you make a suggestion there as to how you might optimize browse production for deer, and you're recommending that the treatment could be in blocks and staggered; correct?

A. That is a suggestion where browse problems would be a consideration.

Q. A limiting factor in terms of the population?

A. Well, we are back to objectives again.

Q. Yes. But you recommend -- you suggest that this is not necessary in the case of moose and I think you're saying that this is the case -- excuse me, the understanding I have that you've come to that conclusion, is that their range is too large; is that correct?

A. When one incorporates this option of staggering treatments across the management regime that exists in the area with which we were concerned, we felt at the time it would be difficult to sell such an option to management relative to what we knew as a movement of moose in the areas where we were conducting the study.

Q. That sounded like one of my questions. Let me get my mind around that again. Are you saying that there was sufficient browse within the area that you were considering that you did not expect browse to be a limiting factor in terms of moose populations; is that...

A. Well, we would not expect it in this case and part of it is, of course, that our observation is that during, say critical periods, winter, that the moose are better able and actually do move out, as I'm sure you recognize, handle the snow better. They can move out there and browse, and this staggering of blocks also is -- because of their range and because of their ability to get around, is not as critical.

Q. What's the average snow depth in Maine in the study area that you're talking about?

A. Well, it varies from winter to winter and it would be anything from perhaps half a metre to, in a more severe case in some of these areas depending on the fetch and the snow cache and so forth, some cases up to a metre. There are areas in a unique and severe winter where it would be more than that.

I would like to add in terms of considering your question that in discussing this and carrying out our appraisal in this study, we had input and review by a number of wildlife biologists who had conducted winter and summer studies with the moose and we've had a number of wildlife biologists on the site and discussed these matters with them.

So my point is we had people who were personally familiar with the needs and movement and

characteristics of moose than I am. We had specialists looking at it.

Q. Are you familiar with the discussion in Exhibit 771 that talks about the utilization of patches left in spray blocks by moose?

A. I'm familiar with Exhibit 771. Perhaps you could refresh my direct familiarity by pointing me in the right direction within that manuscript?

MADAM CHAIR: Is that A or B, Mr. Hanna?

MR. HANNA: Madam Chair, I think we may have ended up with B. I only have A.

DR. McCORMACK: I have it as 771B on my copy.

MR. HANNA: Yes. Well, you have B and I have A, Dr. McCormack. In fact it may not be in -- it may not be in 771A or B, it may be in whatever, 1188, which I believe no one has had a chance to look at on the panel, so I guess I will have to leave it.

Q. Would it surprise you if I was to tell you that patches left unsprayed in the middle of areas treated with herbicides were in fact used significantly greater than sprayed areas for a period up to 43 months after the spray?

DR. McCORMACK: A. I lost the connector

in there. We're talking about patches in areas which have been sprayed?

Q. Right.

A. But I --

Q. Okay. What I'm trying to relate it to is your suggestion here that at least with respect to deer there's a consideration might be given to spraying in blocks and staggering the spray.

A. Yes.

Q. And that can either be planned or it can happen by coincidence; you run out of spray and so you stop spraying there, you don't pick up the right spot, the windblows, you go off course. I'm sure you only too familiar with all the things that can happen.

A. We have actually looked at this and evaluated deer browse activity in such patches and strips, some of them rather small some of them fairly good size, this being the vegetation which I would term as target vegetation not residual stand but patches that, because they were not treated, were allowed to grow.

Q. And would you be surprised if we were to find that these patches in fact were used more intensively than the sprayed patches up to 43 months after the spray had occurred by moose?

A. No, moose of course are capable of browsing some fairly rugged material and, depending on the species present, I would say this is in line with our observations.

Q. And so that from that point of view there could be advantages to moose also of leaving patches within spray areas?

A. Well, leaving patches within spray areas, yes. I don't think that's what we referred to here in our publication, so we're looking at a different -- at least what I deem to be a different situation, rather than management level or operational level blocks to be sprayed and another adjacent one perhaps not to be sprayed for two years but to be sprayed later as a plan to maintain some different levels of browse material.

What we're referring to here is intentional or unintentional strips, islands or perhaps peninsulas that relate directly to the spray pattern that allows some of that target vegetation to continue to develop and be available as browse.

Q. And we could plan those, and there might be some benefit in planning those?

A. Well, it would be hard for me to differ with you since I've been advocating this and it

has been incorporated into a wildlife management manual in the State of Maine and we have observed some benefits.

But at the same time, I'm not here recommending it to the managers in the area of the undertaking, that's not for me to do. I can only explain our situation in the area for which I have some input and responsibility for the management activities which go on.

Q. Dr. McCormack, I would like to go back now to the witness statement and particularly to page 145 of the witness statement. I just wanted to make sure I understand clearly. These are just some clarifications of words that shouldn't take too long.

I'm looking at the first paragraph there at the top, the last two lines or it's actually part of the last sentence. It says -- I'll read the whole sentence:

> "The industry uses the herbicides authorized for use in timber management pursuant to the current registration and authorization processes on the understanding that such use in accordance with authorized procedures does not nor is reasonably likely to have

unacceptable environmental impacts."

Now, when you say unacceptable environmental impacts, we are talking there about direct toxicological impacts; correct?

A. Unacceptable environmental impacts are just that, unacceptable impacts on the environment, and I don't interpret toxicology as the sole basis for this word.

Q. But you are familiar with the registration process, it's a generic process that deals at either a provincial or national level and doesn't deal with site-specific type analysis.

What I'm getting at is that - we have talked about this before - is depending on what structure of the forest I induce through tending I may have varying ranges of -- I think we sawed it off at different levels of potential positive effects, so that those types of environmental impacts can't be dealt with at that level, those have to be dealt with at a site-specific level.

So that your statement here is really dealing with the generic type effects and not the site-specific effects?

A. Generic, yes. In terms of site-specific, we are talking about timber management

across a large forest area and the forest area is a composite of all the units or sites that have these site-specific conditions which are being described, and across the forest no individual local site stands completely alone, it's part of an overall landscape and we have to view it in that framework.

Q. And in order to come to a conclusion whether the impacts of those site-specific applications were acceptable or unacceptable, we'd have to look at all those sites, all the potential applications, and if we were to deal with it at a national level, it's a uncomprehensible type of task to undertake. You wouldn't do that?

A. Well, certainly it would be difficult and not necessary, in my opinion, because interactions of the common species with these treatments are consistent and it's not necessary to evaluate every single site because there's sufficient information to tell us how a given species, especially as we look at the plant components, will react to these treatments, and as information is filed on the prescription or the application which is made, these kinds of things are understandable, we can --

Q. Okay.

A. We have some idea what to expect. So

consequently we know a lot of the pieces and it's not necessary to do what I heard you just describe.

Q. Can we look at the bottom of page 146. You mention a similar type of phraseology, you say:

"Attendant risk of significant adverse impact."

Should I interpret that in the same way as what I have just referred you to on page 145?

A. I would like to read the whole sentence.

Q. Certainly.

A. I think this is in line with the discussion that we have been having, and I certainly agree with what is said here. They're my words.

Q. And this doesn't suggest though that in any way it obviates the need to consider the impacts of tending on a site-specific basis but simply that there are no generic adverse impacts that would rule that out across the area of the undertaking from the outset?

A. I think not. I think in terms of tending and the technology which we're discussing here that it is certainly one of the most, if not the most, thoroughly documented in detailed studies and otherwise

cultural practices available to us to carry out silviculture, been studied for a long period of time, been studied in great detail to a point that the understanding is a very strong understanding within a wealth of forestry literature and the information available to the professionals who have responsibility for carrying out these tending treatments.

Q. Dr. McCormack, can we turn to page 149, the first full paragraph there, the second sentence. It's the same point that we just talked about. Again, I just wanted to make sure I'm reading it properly. You say:

"Occasional skips in spray patterns may serve as refuge for small mammals."

This is the same phenomenon that we were just talking about?

A. Yes, as well as for some songbirds as well, and this is based on work we have been conducting in sprayed clearcuts.

Q. So again at least this author, and based upon your experience in Maine, there is some advantage in this type of a spray pattern?

A. I was a participant in the study though not listed as an author that is cited there.

Q. I want to deal with one other matter

that you had referred to, and that is this matter of short-term versus long-term impacts, and I would like to make sure I clearly understand what you mean by short-term impact.

When you say short-term impact, are you talking about the direct impact of the herbicide on the resident vegetation?

A. Certainly it starts with the direct effect of a herbicide application, and by short term, there again we have site variables involved, but in my thinking short term means anything from when the treatment is applied ranging up to a period of three to five years depending on the dynamics that exist on the site.

Q. And as we said before, that's the direct effect, but that puts in motion what could be very long-term effects in terms of the succession of that stand, and that may well be planned, but those are long-term effects?

A. Most likely is planned, and from that are what I would put in the category as long-term effects following say beyond that, say, three, four, five years.

I have to ask this question simply for the moose. Would you agree from the perspective of the

moose that lives on average five to six years, that a three to five-year reduction in its food supply is short term?

MS. CRONK: Excuse me.

MADAM CHAIR: Ms. Cronk?

MS. CRONK: I'm sorry, Madam Chair. I object to the question.

MR. MARTEL: You will have to ask the moose.

DR. McCORMACK: Well, what can I say? We did ask the moose.

MR. MARTEL: The question is: Did he answer?

DR. McCORMACK: Yes, actually he did. The reason Mr. Lautenschlager is a co-author is Mr. Lautenschlager lived for a period between two and three years with two moose that he raised and he led them through cut-overs throughout that period observing and collecting all their diet, and it was Mr. Lautenschlager's input, based on his direct familiarity with his moose, that was part of our input in drawing these conclusions.

MS. CRONK: I withdraw the objection.

DR. McCORMACK: I mention this because I think it's significant that we put a tremendous amount

of effort in this study and we had a front-line perspective in terms of what was browse and how a moose might choose it, and we might have -- well, I will stop at that.

MR. HANNA: Q. Dr. McCormack, I'm just wondering what to follow up with after that, but I would like to talk to you briefly about the Newton paper, that is the last thing.

I have just three questions to talk about on moose guidelines and we will be done.

DR. McCORMACK: A. Okay. This is the Newton paper from the Journal of Forestry?

Q. Yes it is, 1975.

A. This is not yet an exhibit.

MR. HANNA: Madam Chair, I would like to enter this as an exhibit. It is a paper by Newton, it's entitled: Constructive Use of Herbicides in Forest Resource Management, it was published in 1975 in the Journal of Forestry. (handed)

MADAM CHAIR: That will be Exhibit 1201.

---EXHIBIT NO. 1201: Paper entitled: Constructive Use of Herbicides in Forest Resource Management, by Newton, Journal of Forestry, 1975.

MR. HANNA: Q. I would like to first deal with the section entitled: Analysing the Impacts

on Ecosystem, which is on page 329 there and the first sentence, or the first paragraph there it says:

"To evaluate the impact of a specific method we must first evaluate the effect of achieving its goal, its impact can then be interpreted independently of the degree of the success. This perspective allows us to slant the approach with minimum disturbance in relation to a specific set of management objectives."

This is the similar type of discussion we had yesterday with respect to cost effectiveness; is it not? You just set an objective and then work within that.

DR. McCORMACK: A. Except it incorporates the thinking of Dr. Newton relative to disturbance. Dr. Newton is an ecologist by training, as am I, and we look at this in terms of the tradition of the site following the line of thinking that the least disturbance possible is best, and so that's superimposed within this framework, as I understand your comment, Mr. Hanna.

Q. So if I understand what you're saying to me, Dr. McCormack, you're saying that another criterion that you as a forest ecologist would

incorporate in selecting, I take it, renewal and tending techniques would be to minimize the disturbance of the natural setting to the extent possible and yet still achieve the objective you have set out?

A. Well, it's our function here to address specifically the tending aspects of this and that would be so, with the exception that I did present in my evidence-in-chief earlier here in this room, earlier than this week, with reference to, in some cases, the need to disturb a thick organic pad in order to get planted trees properly placed with their roots at least accessible to the mineral soil.

So we have to keep in mind that sometimes there's a specific need to disturb that thick organic pad.

Q. It's not an overriding concern -- or it's not an overriding criterion, but what you're saying, all other things being equal, that would be a criterion that you would want to try and achieve?

A. Well, we did not have that obstacle, the thick organic pad, but, yes, certainly we want to minimize disturbance.

Q. This question perhaps I should have asked a little bit earlier, but I will ask it now. In your witness statement I didn't see mention of the

matter of stand conversion, particularly stand conversion adduced at least partly by chemical herbicide tending.

Is there a reference to that in your witness statement somewhere that I've missed?

A. I must confess at this point I suspect it is in there, but I lost track of where it might be. Try to understand this is our third day in reading a lot of information and back and forth on these pages and I've kind of lost track, but certainly conversion is a topic that comes up in this regard.

It will take me some time to find it if it is in here, unless some of my colleagues on the panel recall where that might be.

Q. And I didn't see a discussion of the implications of stand conversion on, for example, non-timber values?

A. Where our concern here was timber management and tending for that purpose, I suspect that even if we thought about it, in the interest of keeping to the topic in the statement of evidence, it is probably not here.

Q. Now, with respect to the Newton paper, can you confirm for me that this paper deals strictly with phenoxy herbicides, and I believe there

is also some mention of organic arsenicals, but it does not deal in any way with glyphosate?

A. This paper was published in 1975, which means Michael Newton properly wrote it -- drafted it in 1974 and at that time he was in his earliest stages of looking at glyphosate. So this is restricted to the phenoxies which had been available up to that time, as well as his consideration of the organic arsenicals, as you mentioned.

Q. And the release treatments that he describes here, and actually they are shown, the stands are shown in a photograph in Figure 1 on page 330, are hardwood stands, fairly mature stands with an understory of spruce as opposed to recent cut-overs areas; is that not correct?

A. I'm not exactly sure all we have here. This is a picture from the Pacific northwest which gives us some different conditions. I also believe they are not spruce, but they are Douglas fir. It's hard to tell in the copies of the photographs.

And, again, though I knew this publication existed, I have not looked at the original for some time and I don't recall exactly what the conditions were.

Q. The point that I was really -- you

are probably right, it's probably Douglas fir, is the understory, that wasn't the gist of my question.

The point of the question was more that the types of stands that he analysed in this study with respect to release treatments were primarily fairly mature closed canopy hardwood stands with an understory of conifer?

A. I guess I'd have some reservations about that because looking at the potential crop trees, as best with we can see them in these copies, and knowing that it's Douglas fir and, at the same time, knowing Douglas fir does not become established under canopies, I suspect there has been some harvesting activity or something equivalent to harvesting activity in order to open up the area sufficiently to get those Douglas fir trees alive on the site because the nature of Douglas fir is it does not come in in such a shaded overstory situation.

So there is something else involved here that may be described, but it's unlikely that you would have Douglas fir regeneration present in that kind of a situation.

Q. Now, this paper and none of the others that I've referred to or referred to in your witness statement deal with impacts on species other

than browsers an particularly large ungulates, I think you mentioned lagomorphs in your witness statement, but --

A. Lagomorphs is mentioned in Exhibit 722. I don't think we used the term in the witness statement.

Q. Okay. But withstanding those, there is no mention in any of these papers with respect to wildlife species such as songbird; correct?

MS. CRONK: That's not so, Madam Chair, if you will recall, there is at least three articles that Dr. McCormack has filed by Santillo et al, one deals with small mammals, one deals specifically with song birds. I don't now remember what D'Anieri dealt with, but there is a whole recitation of --

DR. McCORMACK: D'Anieri's paper is small mammals. So we have two papers on small mammals in Santillo's paper and the review inherent in that and songbirds.

MR. HANNA: Q. This paper by Newton and the paper by Carter and the other papers that you've referred to on page 90, indicating the positive impacts of herbicide applications are relating exclusively to browse production for large ungulates and, in fact, it is large ungulates; is that correct?

DR. McCORMACK: A. To the best of my knowledge that's the case with the exception of the other papers mentioned, but I can't recollect totally all the considerations incorporated in the text material that is cited in several places here from Walstad and other authors.

Q. Well, then, can we say that the major focus at least has been on large ungulates? There may be reference to the other things, but in terms of -- many of the positive impacts you've talked about has been in terms of browse?

A. I think that's the way I recollect it, yes.

Q. Can we look on page 334 of the Newton Article.

MR. HANNA: Madam Chair, I am going to ask again, is this Exhibit 1121 -- I'm sorry, 1201?

MADAM CHAIR: Yes, Mr. Hanna.

DR. McCORMACK: Say it again, please?

MR. HANNA: Q. On page 324, please, in the right-hand column under Management of Wildlife Friends and Foes?

DR. McCORMACK: A. Those are Dr. Newton's words.

Q. I am looking towards the bottom of

that paragraph, the third last sentence says:

"Suppression of desirable habitat species caused a marked reduction in use of reforestation areas by deer and certain small mammals during the period of herbicide effect on vegetation."

Would you agree that this type of effect has been reported by other authors, such as Kennedy and Jordan and others that I won't refer to now? It's not a surprising response?

A. During the period of--

Q. Herbicide effect.

A. --the treatment. That's to be expected.

Q. I would like to turn finally in this paragraph or in this article to page 335, the top of the left-hand column, it says:

"The selection of herbicides with no known toxic effects as used in relation to wildlife offers a substantial opportunity for management of food and cover."

Would you agree that this statement is true -- is equally true today?

A. Yes.

MR. HANNA: Madam Chair, if I can now deal with the Exhibit 310. I'll be probably another three or four minutes, you might want to take your afternoon break, and I will be finished.

MADAM CHAIR: Are you asking for a break now, Mr. Hanna?

MR. HANNA: No, I'm asking if I can have four or five more minutes and then you will be relieved of my questions.

MADAM CHAIR: Yes.

MR. HANNA: Q. Dr. McCormack, you are familiar in a general way way with these moose habitat guidelines? You may not know them verbatim, but...

A. Not verbatim, but I'm familiar with the document you have.

Q. Yes. Now, the green pages at the beginning are the actual guidelines themselves, the white material that follows is -- provides supporting documentation and technical back-up for the guidelines themselves. You are familiar with that?

A. I am, yes.

Q. I want to deal just with the green pages, if we can, please.

A. The green pages.

Q. Can you confirm for me that the only

place in the guidelines which - when I refer to guidelines I am talking about the green pages - that mention is made of chemical site preparation and tending is in 4(c) on page (ii)?

A. It certainly is mentioned in 4(c). To answer your question absolutely, I would want to read through this, but it clearly is stated in 4(c).

Q. If that is the only place that it's mentioned, can you indicate to me, given your knowledge of forest plant succession and the types of considerations that one would want to take into account in terms of managing the forest in terms of moose browse, whether this provides adequate direction to forest managers in terms of predicting the type and intensity of tending that should be applied to satisfy the requirements of moose?

A. Well, I see this statement as a flag, if you will, that alerts the manager to the need for careful consideration of the anticipated effectiveness of the herbicide in controlling woody plants, and they would then draw on the information that I have referred to earlier that is available today that relates in some detail that type of information.

I think it would take considerable page space to include the type of detailed information

available today in such a document. So as I see this, it would refer the manager to that type of information, but definitely specifies the importance of considering it.

Q. So if I can understand what you're saying, if you were involved in this or consulted in terms of forest succession as a forest ecologist, this would be a flag that says we've got to look at this and then you would invoke the knowledge and tools that you have available to you to then look at it in a detailed way; is that...

A. I, of course, can't speak for the managers who would have to be alerted by this flag, but if they were to be so alerted, then I would be in a good position, or people in similar positions as mine, to provide ample information for them to respond to this statement here under 4(c).

Q. And in order to undertake that, it is a fairly complex analysis because you'd have to look at the supply of habitat resources within the forest land base that's being managed, the requirement of the number of animals that are involved, how the land base is likely -- the forest is likely to evolve over time and space, it's not a simple task?

A. What you are referring to there is

background information that I can't comment on. I can only assume that a manager would utilize all the information available to follow a line of thinking which you suggest, but it's certainly beyond my ability in these proceedings to speak for the managers and what they have available.

Q. I understand that, I guess what I'm coming at is this question. If I was to approach you and approach you as a forest ecologist, and I said: Dr. McCormack, I am interested in knowing what the evolution of this forest is likely to look like if I undertake this tending versus this tending versus this tending option, what would be involved from your point of view in terms of providing to me an understanding of the forest structure in terms of moose browse or late winter cover area?

MS. CRONK: I'm sorry, Madam Chair, in my respectful submission that is an impossible question. I don't even understand this tending versus that tending versus this tending examples and surely, even assuming for the moment that Dr. McCormack is in a position to respond to that question, he has to have an understanding of what Mr. Hanna means.

I know it's late in the afternoon, but that question really is impossible for a response of an

intelligible answer from any expert witness.

MADAM CHAIR: Could you clarify the question, Mr. Hanna.

MR. HANNA: Certainly, Madam Chair.

Q. If I was to come to you, Dr. McCormack, as a forest ecologist and say that I was concerned about the provision of moose browse on my forest land base, what would be involved for you as a forest ecologist to provide for me an estimation of the succession of the forest in terms of overstory and in terms of understory that might be important in terms of - let's take one species - moose, that I would be concerned about?

MS. CRONK: Dr. McCormack at no time in his evidence, Madam Chair, has in any way suggested that he was a moose manager for the purposes of laying out that kind of a management approach or plan.

If Mr. Hanna is interested in Dr. McCormack's experience and observations as to the effect through tending on moose and moose browse, that's entirely appropriate and I acknowledge that, that's what Dr. McCormack gave evidence on.

But if Mr. Hanna through this witness is attempting to elicit an approach that could be used to manage for moose browse through tending, with the

greatest of respect to Dr. McCormack, that's the background that has been put before you and that is not his expertise before you.

MR. HANNA: Madam Chair, my question was not in any way phrased to ask Dr. McCormack his view as to how much browse we need in the province or how much is needed on an individual moose basis or anything of that nature.

Dr. McCormack has told us earlier in his evidence that it is his view that we have sufficient literature in order to predict forest composition with a reasonable degree of certainty if we treat the land base with glyphosate or if we treat it with 2,4-D and I'm approaching him now as a forest ecologist and asking him, if I was to come to him and what the successional progression of the forest land base might be, and I was to specify to him what I meant by moose browse, what he as a forest ecologist, which I believe is what he is qualified as a witness before this Board, what it would involved for him to provide me with in terms of that temporal and spacial profile before us.

MS. CRONK: I'm sorry --

MADAM CHAIR: Excuse me, Ms. Cronk. I think that's not an answerable question.

It would be helpful to the Board to know,

if you wanted to ask from the point of view of a forester, the kind of information that he might want to know in terms of tending and protecting habitat.

I don't think it helps the Board to have a theoretical question about one forest ecologist asking Dr. McCormack about those broad dimensions of the forest. If you could make it more of a specific example that would be helpful to the Board.

MR. HANNA: Well, Madam Chair, I'm sorry for being so apparently obtuse, it wasn't intended to be.

I look in guideline 4(c) and it says -- and this is intended I believe for forest managers, in particular moose managers that:

> "Managers should carefully consider the anticipated effectiveness of the herbicide in controlling woody plants (browse) in the amount and proximity of deciduous growth outside of the treatment area."

And the situation that I am putting to Dr. McCormack is, I am coming to him as a moose manager, I have certain objectives in terms of moose populations and whatever, and I will even come to him and say I need certain amounts of moose browse and

define it in terms of species, vegetation, understory and whatever.

And I as a moose manager may not be a forest ecologist, in terms of understanding the complexities of forest succession, and in those circumstance I may well go to a Dr. McCormack, who is an expert in forest succession, and he has indicated that he has the tools available to him to do that sort of projection in terms of how the forest might evolve.

I am interested in knowing what would be involved if I was to approach him with a question as to how the forest is likely to evolve under different chemical treatment applications in order to understand the complexity of the task and the type of expertise that might be required to address that type of a question, which is patently in the guidelines for moose habitat protection.

MADAM CHAIR: Well, I think Dr. McCormack is going to say he needs some site specific details in terms of responding at all to that.

Let me see what your understanding is. Do you think that these guidelines -- aren't these guidelines for forest managers? Aren't these guidelines for the type of witnesses we have in front of us?

Are you trying to phrase a question in the sense a Mr. McNicol going to talk to Dr. McCormack, or are you talking about a forest manager going for that kind of information?

MR. HANNA: My understanding was that the Mr. McNicols of this world were also involved in the implementation of these guidelines, but I am happy to have the Mr. Bunces and Mr. Smiths also being involved in their implementation.

The question that I am put putting to this witness is: In order to deal with the question of, for example, the amount and proximity of deciduous growth outside the treatment area, one can't just look at that at one window in time, one has to look at that in terms of the evolution of the forest.

In order to that evolutionary perspective, I would go to an expert like Dr. McCormack and say: How do you see this forest evolving over time if I undertake certain types of tending operations, and once he has come back and said: Here's how I see these stands evolving, this is the amount of deciduous and conifer vegetation you can expect, here is the type of understory you might expect, et cetera, et cetera, et cetera, I can then as a Mr. Bunce or Mr. Smith - I am only picking you as examples - or Mr. McNicols, I can

then say: Okay, well, there is what the forest is going to look like, I will then use my local experience and knowledge and be able then to decide whether or not I have adequate browse in my forest land base.

And I'm suggesting that that's the type of expertise that Dr. McCormack would give me and I am interested in knowing what is involved to undertake that type of analysis of the forest evolution under different management regimes, particularly with respect to tending.

MS. CRONK: Madam Chair, if Mr. Hanna has a specific question that he wishes to put to Dr. McCormack, that's specific as to the hypothetical that he wishes to consider and specific with respect to the tending approach he is considering, it may be that Dr. McCormack is in a position to and qualified to answer it.

But even with the rationale that has been explained, which for the moment I take no objection, that question can't be answered in any useful way to the Board, in my respectful submission. It is entirely too theoretical.

MADAM CHAIR: Yes. We are not understanding it, Mr. Hanna. We also think that a specific example would be much more helpful.

MR. HANNA: All right. I will try and manufacture a specific example here.

Q. This will be somewhat spontaneous, Dr. McCormack, so I apologize if I leave out something.

We have a forest management unit, let's say it's a small one, a hundred thousand hectares comprised of - we will be modest - 8,000 stands, and I am tending on any one year, let's say, one per cent of the land base, I'm also harvesting, let's say, 1.5 per cent of the harvested land base, so I am not tending all of the sites.

I am now interested in looking at what the consequences of two tending alternatives I am going to use on all sites. One site or one alternative is to spray that one per cent of the area, aerially spray one per cent of the area with glyphosate and the other option I have is to not spray.

I provide to you the current structure of the forest and the current sites. We will say they're all mixed wood sites, medium rich, moist sites, and I come to you and I say: Okay, I want to know what the evolution of those stands are likely to be across that forest management unit for one rotation of the forest, maintaining that management regime constantly for the hundred years.

Can you provide for me or what would be involved to provide for me at different windows, say 10, 20, 40 and 60 and 100 years - rotation would be a hundred years - what the forest composition would be in the -- what the species composition would be in each of the stands.

MS. CRONK: I'm sorry, Madam Chair, I am going to have to object again even though the specifics have been provided.

I do not understand how a question framed that way can be of ultimate assistance to the Board. It incorporates so many facets of detail that for a proper evaluation they would have to go away and think about it and study it. Unless an answer off the top and a gut reaction is all that Mr. Hanna wants, I submit to you there would be no probative value to any response you get regardless of the identity of the expert.

And I remind Mr. Hanna that there are at least five industry people in this room who know something about forest succession as well as Dr. McCormack, although his questions for the last 15 minutes have suggested that one would have to go to a forest ecologist of Dr. McCormack's stature to obtain information with respect to that, I take objection to

that, too.

This is the kind of thing that if he really wanted it dealt with by any of these witnesses in any detail in a thoughtful, informed way that might be of some use to the Board, it could have been the subject of an interrogatory. He could have raised it with us. This is not the way, even for the range of hypothetical questions which are traditionally allowed in proceedings of this kind to proceed. I don't know how someone could begin to fairly answer that kind of question. I just don't.

MR. HANNA: Two --

MADAM CHAIR: We agree with Ms. Cronk, Mr. Hanna. We were looking for a simple illustration.

Can we turn it around perhaps and just ask Dr. McCormack, when he is consulted about forest succession by managers who are undertaking spray operations, and specifically about wildlife habitat, are you able to respond at all to those kinds of questions?

Is that something that you feel is beyond your purview? Are you able to give some practical advice? Are you able to point them to a body of literature that helps them? What do you do exactly if asked that kind of question?

DR. McCORMACK: Yes, Madam Chair, that does in fact happen and I respond in -- actually a variety of ways, but I think to address the type of thing that could occur relative to these guidelines, if we temporarily forget moose as the specific item, but it is an animal that lives in a vegetation habitat, there is sufficient volume of printed material as guidelines, as literature from herbicide manufacturers, as literature published by the Weed Science Societies, summaries of information from the expert committee on weeds Canada, and so forth, that is sizable enough that on occasion when I have had offered this level of information to a manager they have asked me to select from it my choice of perhaps 10 per cent of the total pile. It is on that order.

This is one approach if the manager is obviously in a position to take that information and interpret it. Another approach would be to assist the manager relative to spectra of activity and the likelihood of species to be suppressed or encouraged in their development on the site, sometimes site visits are made.

Our most recent approach has been beyond formal regularly scheduled training programs, in fact, my first full day back in the office this summer will

be spent all day at the study site we've been discussing at Austin Pond and others with a meeting of the main chapter of the Wildlife Society.

We have 35 wildlife biologists registered for the meeting and we will hold a workshop discussing some of these very questions standing in the woods, which is probably the best place to look at these kinds of things, and we will discuss them and have follow-up discussions in order to assist them in their understanding of the types of questions I think are interwoven within Mr. Hanna's questions.

The other is that on occasion managers and wildlife biologists, we must address this question, participate in a formal training programs, and at that time considerable time is spent formulating tables or lists of species which are susceptible, moderately susceptible and so forth, so that it is at least possible to project the vegetation compositions in the years immediately following a treatment of a given herbicide.

I don't know if that answers the question, but in the wake of what has preceded it, I offer that as my first best shot.

MADAM CHAIR: Thank you.

MR. HANNA: Q. Dr. McCormack, I

appreciate that and that certainly addresses part of it.

There is also the - and you use the term the immediate effect - immediate effect of the application on different species; there is also the longer term effect that one needs to consider in terms of, if you will, course of evolution that you have set for the stand, and so that's the other side of it.

There's the immediate effect and the longer term effect; would you agree?

DR. McCORMACK: A. We are now prepared to discuss conditions and relative conditions certainly up into 15 to 20 years following treatment.

And even this site, as you can see from the date of treatment, that we will be looking at here in the future is -- we are now 13 years and it's possible from the condition of that stand to really, in a sound way, project what it's going to look like over the next many years.

Q. And because we work in a rotation in terms of the way that we manage the forest, as much as we look at wood supply on a rotation scale, we must look at wildlife habitat and other non-timber values that are affected by that forest structure in the same time frame; would you agree?

A. Oh, I think they should be looked at. I'm not ready to stay we, since the thrust of this panel is timber production, but certainly there are people involved in the management process who will look at it.

Q. And would you agree that that's not a simple task, it's something that requires a fairly in-depth analysis?

A. The forest is one of the most complex dynamic entities out there and anything we do with it requires attention to that complexity.

MR. HANNA: Dr. McCormack and rest of the panel, I thank you for your time.

Madam Chair, those are my questions. Before, however, I terminate there is just one thing I would like to clarify on the record. Ms. Cronk indicated that I had been directing my questions suggesting that Mr. McCormack was the only one to answer the question.

At the outside of my cross-examination I invited all panel members to respond in any way that they meant --

MS. CRONK: I didn't mean that, Mr. Hanna.

MR. HANNA: Can I finish, please.

MS. CRONK: That's not what I said.

MR. HANNA: And I want to make sure the record is very clear. I was not in any way trying to isolate Mr. McCormack from any of the other panel members.

And before I step down, if any panel member feels they have been isolated and they have something to add to this cross-examination, I give them the opportunity now to say whatever they want, because that was not my intention.

MADAM CHAIR: Do any of the panel members have anything to add to their evidence?

(no response)

Thank you very much, Mr. Hanna.

Ms. Kleer? Shall we take the afternoon break now?

MS. KLEER: Yes.

MADAM CHAIR: And come back. We will be back in 20 minutes.

---Recess taken at 3:20 p.m.

---On resuming at 3:40 p.m.

MADAM CHAIR: Please be seated.

Ms. Kleer?

MR. TOMCHICK: Excuse me, Madam Chair?

MADAM CHAIR: Yes, Mr. Tomchick?

MR. TOMCHICK: Yesterday Mr. Castrilli gave a few of us on the panel here an undertaking to get some numbers regarding the total area and productive area on our respective forest management agreements.

Would you like us to present those numbers now or some other time?

MADAM CHAIR: Is that all right with you, Ms. Kleer?

MS. KLEER: That's fine with me.

MADAM CHAIR: Please.

MR. TOMCHICK: Okay. On behalf of the Quebec & Ontario Paper Company we have three forest management agreements.

The Nagogami Forest FMA has a total area of 449,600 hectares and productive area of 382,000 hectares. The Timmins Forest has a total area of 189,500 hectares --

MS. CRONK: I'm sorry, can I have that again, please, Mr. Tomchick?

MR. TOMCHICK: The Timmins Forest has a total area of 189,500 hectares and a productive area of 160,400 hectares. Finally, the Driftwood Forest FMA has a total area of 171,800 hectares and a productive area of 144,300 hectares.

MR. SMITH: The Abitibi-Price Spruce River Forest has a total area of 748,730 hectares and a productive area of 598,946 hectares.

MR. FERGUSON: The forest management agreements associated with Canadian Pacific Forest, Thunder Bay Woodlands.

MR. FREIDIN: Which one is he talking about?

MR. FERGUSON: Canadian Pacific Forest, Thunder Bay Woodlands. The English River Forest has a total area of 626,597 hectares and a productive forest of 462,314 hectares. The Dog River/Matawin Forest has a total area of 870,769 hectares with a productive forest of 672,489 hectares. The Bright Sand FMA has a total area of 436,848 hectares with a productive forest of 307,998 hectares. And, lastly, the Black Sturgeon Forest has a total area of 534,453 hectares with productive forest land of that being 452,203 hectares.

MADAM CHAIR: Thank you.

Mr. Smith, could you repeat the numbers you gave, please?

MR. SMITH: Sure. Abitibi-Price Spruce River Forest, total area 748,730 hectares, productive area 598,946 hectares.

MADAM CHAIR: Thank you.

Ms. Kleer?

MS. KLEER: Good afternoon, Madam Chair. Good afternoon, Mr. Martel.

CROSS-EXAMINATION BY MS. KLEER:

Q. I'm going to direct my first set of questions to Mr. Tomchick. I believe you are the one who should be answering the questions, but if anyone feels themselves more qualified, please interrupt.

The first thing that I would like to refer to is an answer to an interrogatory submitted by Nishnawbe-Aski Nation, Question No. 4 and also Question No. 7.

These have not yet been introduced, so we'd like to introduce them now as exhibits.

MADAM CHAIR: That will be Exhibit 1202.

MS. KLEER: Thank you.

---EXHIBIT NO. 1202: Nishnawbe-Aski Nation Interrogatory Question Nos. 4 and 7 (answers thereto) re OFIA/OLMA Panel No. 7.

MS. KLEER: Q. If you can look at paragraph 2 --

MR. TOMCHICK: A. Are we looking at Question No. 4?

Q. Yes, Question No. 4.

A. I think Dr. McCormack might be better

prepared to answer these questions.

Q. All right, that's fine.

Dr. McCormack, with respect to straw strawberries and blueberries, I did not get a clear sense from your answer here as to whether or not they were suppressed by 2,4-D and by triclopyr. Could you please clarify that for me?

DR. McCORMACK: A. You are referring -- okay, I will just look at this.

Q. Paragraph 2 refers to effects of glyphosate, hexazinone and simazine on strawberries and blueberries and I was trying to get a sense of how strawberries and blueberries were affected by 2,4-D and triclopyr.

A. Okay. With regard to 2,4-D it would be very closely tied to the rate of active ingredient applied. At higher rates of 2,4-D I would expect some suppression, more on the strawberries than the blueberries.

Q. If we take the rate that is generally applied on forests, how would that affect strawberries and blueberries?

A. Considering that strawberries and blueberries are ground cover, I think - and this is an opinion based on my experience with limited amounts of

strawberries and blueberries in pots which I have observed, and I would invite specific comments from any of the other panel members - it would be my judgment that the rates applied would be marginal in terms of effect, and it would be only at any upper end of the active ingredient applied where injury or perhaps some mortality would occur.

I think my experience has been that there may be some short-term injuries but both species have an excellent capability of recovering in a relatively short period of time.

Q. Relatively short, you mean a season?

A. To two seasons.

Q. And is this with respect to just 2,4-D or...

A. 2,4-D.

Q. All right.

A. And your other herbicide in question was--

Q. Triclopyr.

A. --triclopyr. I would expect triclopyr, again at what would likely be the upper end of the rates applied if it makes direct contact it would injure those species, but it would have to be a fairly direct impact of the spray particles on the

foliage of the species.

Q. Okay. And again, is there a recovery term, short term, long term?

A. I think it's true here as well, that our observations have been that both blueberries and strawberries, and by this I assume you mean the low bush blueberry?

Q. Yes.

A. They are quite resilient and come back, especially our observations on study plots this is true of the blueberries. Matter of fact, because of their ability to recover and some of the other surrounding vegetation has been suppressed, that they come back quite well, and actually in terms of your question on 2,4-D, 2,4-D of course is used for some broadleaf weed suppression in commercial blueberry production but must be applied in a way that you're sure you don't injure the blueberries.

Q. I would also like to look at your second paragraph answer in the first -- I'm sorry, the second sentence. It says:

"Lower rates of glyphosate may not cause reduction of strawberries and usually do not detrimentally impact blueberries."

When would a lower rate of glyphosate

detrimentally impact blueberries?

A. Well, nothing comes to mind and I recall in our earlier development work with glyphosate we almost thought we were on a track to make a recommendation to low bush blueberry growers in Maine that perhaps they had a herbicide of value that could assist them in culturing the blueberries. They seemed to be quite resistant to those lower rates of glyphosate.

Q. So you're referring -- when you speak of blueberries, I take it your answers refer to commercial low bush blueberries?

A. Well, it's all wild. They have been fire cultured over the years until recently when some herbicides have been used. These are wild, as I say fire cultured is the way they have been traditionally maintained in the State of Maine for as long as any of us can remember, and it is only in recent years, partly in response to some of the objections to the smoke when they were burning since our tourist traffic is increased, that the herbicide technology has been used to accomplish much the same purpose but without the objectionable smoke.

Q. I see. Going then to the third paragraph in the same answer to Question 4, at the last

two sentences it says that:

"Raspberries develop into very dense cover which causes some of the most serious suppression of conifer crop trees Because of its high density it is not totally removed from operationally treated sites."

Does that indicate then that even after herbicide application that some of the berry bushes would in the same year still bear fruit?

A. Well, the treatments that occur in raspberry - and this is definitely typical in the area of the undertaking - occur at a time that is later in the season, in some cases even after fruit has ripened, and whether they would recover for fruit the next year is unlikely because you're dependent on the second year canes for the fruit and it would be the second year canes that had been most seriously suppressed, and it is in the first year after treatment that we see a proliferation of the priming of the first year canes that do not flower until the second year.

So it would -- even where raspberry recovers, it would carry into the second year because of the nature of flowering and fruiting of the species.

So, no, you couldn't really accept maybe

an island that had not been treated. But assuming we're talking only about the treated vegetation, I would not want to count on fruit in the next year but very definitely the possibility of fruit by the second year.

Q. Okay, thank you.

MR. FERGUSON: A. Ms. Kleer, if I may just add a point to Dr. McCormack's evidence concerning blueberries.

It has been my observation on the English River Forest that as the stands come to the point of -- or our regenerating areas come to the point of requiring tending, that being the conifer species or older poplar brushy species, that the blueberries are also being suppressed at the same time; in fact the blueberries may be disappearing. The opening of the release of the conifer species may in fact produce the blueberries as well and improve the blueberry crop for subsequent years.

Q. Thank you. If we could then turn to Interrogatory 7, this was also in that package. I'm not certain who prepared that, the answer to that question. I'm looking specifically at 7(a):

"The Industry is supportive of continued monitoring of human health effects

in the use of insecticides in both the occupational and bystander exposure contexts."

So I would just like someone, that's a confirmation from someone on this panel.

DR. McCORMACK: A. This is a specific question regarding insecticides?

Q. Yes. I'm not certain who prepared that answer.

A. I would suggest that -- Dean Carrow, do you have a copy of this before you?

DEAN CARROW: A. Sorry, Ms. Kleer, was your question in relation to Answer 7(a) particularly?

Q. Yes, yes. All I'm asking for is a confirmation. Is that the forest industry's position?

A. Yes it is, with respect to 7(a).

Q. And is that with respect to all insecticides that are presently used in the area of the undertaking and that may be used in future, or can you make that comment?

A. Well, certainly it applies to the insecticides that are currently registered for use in the area of the undertaking and, as a general principle, I'm sure that Industry would support continued monitoring of human health effects both with

regards to occupational and bystander exposure.

Q. Does the Industry participate in any such monitoring studies or is that something that they support in principle?

A. At the present time the responsibility for monitoring, particularly with respect to -- maybe I should have that, sorry.

At the present time - if I could just rephrase my answer, Ms. Kleer - the insecticide applications of course, as you probably are aware, are the responsibility of the Ministry of Natural Resources and I'm not in a position to speak on behalf of the Ministry of course, but certainly this answer is meant to simply reflect Industry's support for the principle of continued monitoring.

Some of that monitoring is carried out by the Ministry of the Environment and, in some cases, it's carried out by the Ministry of Health as well.

Q. But the Ministry itself does not carry that out; that's what I guess I'm trying to get at?

A. No, that's correct.

Q. Thank you. If we could turn to page 159 of the witness statement. My questions are with respect to the Task Force on FMAs. There is one

particular comment that is referred to at page 159. I believe, Dr. McCormack, that you may be the appropriate one, but again I'm not certain who wrote it.

"The company and the MNR personnel indicated in their briefs to the Task Force on FMAs that more registered herbicides for aerial applications were required."

Is that correct?

MR. TOMCHICK: A. That's correct.

Q. I take it then that you have reviewed the Task Force report which has been introduced beforehand, Exhibit 940?

A. Yes, it is Exhibit 940.

MS. KLEER: Does the Board have a copy of Exhibit 940 in front of them?

MADAM CHAIR: We should, Ms. Kleer. What does it look like?

MS. KLEER: Pardon me?

MADAM CHAIR: What does it look like, the front cover of it?

Thank you. We have got a copy.

MS. KLEER: Thank you. It's a very brief section, I can just read it.

MS. CRONK: Does the witness have a copy?

MR. FERGUSON: I have two.

MS. CRONK: You have got a second?

MR. FERGUSON: Yes. (handed)

MS. KLEER: Q. Okay. Mr. Tomchick, are you aware or does this document indicate rather, that the Task Force received any submissions that alternative vegetation management techniques ought also to be further explored?

MR. TOMCHICK: A. I wasn't one of the members on the Task Force and I don't know what those particular briefs were.

As far as I can recollect, when -- I was one of the company representatives who did give a brief on behalf of the Quebec & Ontario Paper Company to the Task Force and, as far as I can recollect, we didn't make any mention of alternative vegetation management techniques in our particular brief, but I can only speak for Quebec & Ontario Paper Company.

Q. Did you make a recommendation with respect to having more registered herbicides?

A. Yes, we did.

Q. All right. If we could look at page 29 of Exhibit 940, the paragraph that begins: "Many company and MNR personnel..."

A. That's right.

Q. The third full paragraph. The last sentence says that:

"Competition control is essential to timber production on productive sites and aerial herbicide operations are the only effective means of competition control in most northern Ontario situations."

Do you agree with that statement?

A. Yes, I do.

Q. Does this statement indicate to you perhaps - and perhaps you can just give your opinion, your own opinion, that aerial herbicide operations -- only aerial herbicide operations are effective as a means of competition control?

I guess what I'm really getting at is, what consideration is given to alternative vegetation management techniques as a means of competition control. This statement suggests to me that only aerial herbicide applications is really given any real true consideration.

A. I didn't write this, but I would gather from that statement that the other alternatives of vegetation control were looked at and the Task Force concluded that aerial herbicide operations were the

only effective means of competition control in most northern Ontario situations.

Q. And you concur in that, as you said earlier?

A. Yes.

Q. Can you look at page 155.

Page 155 it says in the first paragraph:

"Research, development and registration of additional herbicides for use in timber management in the area of the undertaking, as well as alternative vegetation management techniques, must be supported and encouraged."

I don't understand how you can put that statement together with the view that seems to be held that aerial herbicide applications --

MR. MARTEL: What page?

MS. CRONK: 155.

MS. KLEER: Q. Sorry, that aerial herbicide applications are the only effective means of competition control.

MR. TOMCHICK: A. I think it's very important for timber managers to evaluate and constantly evaluate all the different alternatives that are available to us as they come on stream or as

research and development makes them available.

So we certainly do not look at just one alternative. We consider many alternatives and alternative vegetation management techniques, certainly if they became or if there was a technique that came along that was just as effective or relatively -- had the same relative effectiveness as aerial application of herbicide, we would certainly consider it.

Q. But at present, it's your opinion that alternative vegetation management techniques simply do not fit the bill?

A. On the large scale operations that are usually carried out in northern Ontario currently, that is a fact.

Q. Does the forest industry itself carry out any research and development an alternative vegetation management techniques?

A. I'm not aware of any and, again, I'm just speaking on behalf of my company now. We have not carried out any structured research on alternative vegetation management techniques.

However, our company is a member of the Ontario Tree Improvement Council and we have -- through that counsel we've established seed orchards in northern Ontario, and at the present time we are

looking at an informal trial looking at different means of competition control within the seed orchard, including such things as chips, wood chips, plastic, used paper machine felts. In fact, we are using some of our sludge from our mill to see if we can use that as a mulch for competition control. So that's an informal -- one example of an informal trial.

I'm not aware of any other trials that the Industry is carrying out.

Q. All right. Actually I was going to get to question about these informal trials. I believe in your answer at 5(b) of the exhibit that was just introduced -- sorry, 5(b) is one that has not been yet been introduced, perhaps we should -- I apologize it is in the package.

A. It's of Exhibit 1136.

MS. CRONK: We filed it as well.

MS. KLEER: All right.

Q. Now, I believe that the example you just gave to me is recorded there in that answer?

MR. TOMCHICK: A. That's correct.

Q. Can you confirm that there is no record keeping system that is set up by Industry that would allow you to judge the effectiveness of that this technique?

A. I'm certain that the Ontario Tree Improvement Council will certainly be setting up a record keeping system to keep track of this particular test.

Q. If you go back to the previous paragraph in the answer to 5(b), where it refers to informal trials, I guess perhaps you were referring to the third paragraph, talking about the Ontario Tree Improvement Council.

In the prior paragraph, is says that:

"Informal trials to evaluate such techniques, i.e., alternative vegetation management techniques, have been undertaken in the past. These type of informal trials are done to determine whether improvements can be made to the standard process of vegetation management for the specific site and conditions at hand. The results may or may not be documented in internal files of any company, rather, the knowledge becomes part of the experience of the individuals working on the area and this knowledge forms the foundation for deciding on the most effective techniques to be used."

Now, that suggests to me that there is no record keeping system for that type of informal trial done by a company; is that right?

A. That's, I guess, inherent in the meaning of informal.

Q. Would it be possible -- first of all, would it be useful as a management tool to try and put that information together so that other forest managers could have access to the results?

A. I imagine it would be useful and, you know, we support the research -- the need for research and development through alternative vegetation management techniques.

Q. Is it something feasible in your opinion to set up such a record keeping system?

A. I don't think -- not knowing the specifics of these informal trials, I don't think it would be possible - and maybe my colleagues could help me out - I don't think it would be possible to document -- go back and document some of these in informal trials.

They weren't set up, I don't believe, with a specific experimental design in mind, anything like that.

MR. STANCLIK: A. Ms. Kleer, some

companies also consider that proprietary information and may not be willing to share the information.

Q. If we look also at that same paragraph that we were looking at in 5(b), I just wanted a quick clarification. It says at the end of that paragraph:

"...this knowledge..." i.e. the test knowledge, "... forms the foundation for deciding on the most effective techniques to be used."

Am I correct then in saying or assuming that it is the individual forester in the field who is going to decide what vegetation management technique will be used, or is it made at a higher level? Is that decision made at a higher level?

Now I'm referring not just to alternatives to pest -- to herbicides, but also to herbicide themselves?

MR. TOMCHICK: A. Well, the choice of tending technique is made by the timber manager who is writing the timber management plan in the annual work schedules.

Q. I just wanted clarification of that. If we could also look at interrogatory 5(b), the last paragraph which refers to the Ontario Forest Research

Committee. I am not familiar with that committee, perhaps you could explain to me whether or not particular industries or whether or not the OFIA or OLMA sit on the forest research committee?

A. Yes, I gave quite a bit of evidence on this yesterday or the day before.

DR. McCORMACK: Monday.

MR. TOMCHICK: Monday I guess it was. the Ontario Forestry Research Committee was established by the Ontario Forestry Council in 1987.

What the Ontario Forest Research Committee does is develop research priorities for the council's consideration. Now, on that committee there are members, including members from MNR, the Great Lakes Forestry Centre, Forest Industry, the Ontario Tree Improvement Council and forestry universities.

There are six subcommittees of that Forestry Research Committee.

Do you want me to name the six subcommittees. It is already in the evidence.

Q. No, I think that's sufficient. So, then, would each group have a representative on each of the committees or would it not be organized that way? Would it be organized by person?

A. Industry has representation on each

of the subcommittees and, in fact, three of the subcommittees are chaired by Industry people.

Q. When these representations are made -- or, sorry, recommendation are made, where do they go from there; in other words, if it has been identified as a research priority, does the Forest Research Committee go on and get together the people to do the research, or how is that organized?

A. I'm not really in a position to answer that because I'm not on any of these committees; however, it is my understanding that the Ontario Forestry Council makes decisions as to the direction and level of the forestry research, this is government funded forestry research, and they take into consideration the recommendations given to them by the Ontario Forestry Research Committee.

DEAN CARROW: A. Ms. Kleer, perhaps I could be helpful on that particular question. I am a member of the Ontario Forestry Research Committee and I serve as Chairman of the protection subcommittee.

Since its formation in 1987, as Mr. Tomchick has pointed out, it has concerned itself primarily with two initiatives, and one is to comprehensively re-examine all of the forestry research carried on in the Province of Ontario and, in fact, to

restructure the entire research program for the Province of Ontario based on priorities that had been established by Industry and by provincial resource managers.

That's been done and, in fact, a so-called matrix exists of all of the high priority research topics relating to forestry for the Province of Ontario at the present time.

The second part of that initiative has been to create and get running the Ontario Forestry Research Institute which will very shortly be relocated to Sault Ste. Marie and it will operate as a partnership between Industry and the provincial government with joint funding.

The idea being that the funding that is administered by the OFRI will be directed to the high priority research topics that have been identified by that particular committee.

Q. So do I understand this matrix, then, to prioritize among the priorities?

A. What it has done is it has identified the high priority research topics within each of the six areas of research which Mr. Tomchick reviewed the other day.

Q. So is this particular research

priority; i.e., need for alternative vegetation management techniques, a high priority?

A. I couldn't comment on that right now without going back and reviewing the matrix, unless somebody else can comment on that.

MR. TOMCHICK: A. If it might help, I am attempting now to get a copy of those research priorities.

Q. If I could ask this question again tomorrow, then I would like to look further into that.

Perhaps you can just answer at this point whether or not the development of more alternative chemical insecticided -- sorry, herbicides, has also been identified as as research priority. Would you know that?

DEAN CARROW: A. Again, I would want to review that.

Q. All right. If I can -- would it be possible for you to get that tonight; do you know?

MR. TOMCHICK: A. I'm not sure, but I will try.

Q. Thank you. Then just one final point just to clarify. The institute will not actually carry out the research, will they partition it out to universities or will it be done by the institute?

DEAN CARROW: A. The institute I think will operate in both of those manners you've described, Ms. Kleer.

As I said, they will relocate to Sault Ste. Marie in the fall of this year and there is a research lab that is close to being completed right now which will house scientists who have been with the Ministry of Natural Resources as part of their research group.

My understanding is that the research that has been identified as high priority will be carried out through a combination of mechanisms; some of it being carried out by those particular scientists, some of it being contracted out to scientists at the universities, for example, and perhaps other independent scientists and to industrial cooperators as well, I guess. It will be administered through a research contracting process, as I understand it.

Q. I take it that the Ontario Forest Research Institute will be the sole source of funding or would it function by making proposals to other government bodies to get research monies? Are you familiar with that function?

A. My understanding at the present time is that the institute itself will have its own budget

which it will administer. I'm not sure of any plans for it to derive funding from any other sources.

Q. All right. So at this point then it's safe to say that none of the research priorities that have been identified have yet been analysed or started to be put towards a research project?

A. No, I think it's -- I should clarify that. In fact, many of the high priority research topics are already underway and they have been underway for a considerable period of time.

The other element of that that I should clarify just so there isn't the wrong impression left, is that the research program at the Great Lakes Forestry Centre, which is Forestry Canada's establishment, has a very comprehensive forestry research program underway and they have operated under their own set of priorities and will continue to do that so. In fact, that particular research program will complement what is carried out by the Ontario Forestry Research Institute.

So the fact that a high priority research area doesn't show up within the institute doesn't mean that it is not necessarily carried out, for example, by Forestry Canada. So one would have to look at all of the research agencies within the province to get a

complete picture of high priority research.

Q. Could I get an undertaking -- an answer to an undertaking with respect to alternative vegetation management techniques and where the research on that particular research priority is at at this point in time?

A. Yes, sure.

Q. And with that, if possible, the level of funding that's been allocated to that.

MS. CRONK: Can I just understand the undertaking more fully.

Dean Carrow indicated that in order to get a complete picture you would have to look at the research situation for a number of provincial agencies. Is Ms. Kleer asking him to do that?

MADAM CHAIR: Are you asking, Ms. Kleer, only for the Ontario Forestry Research Institute?

MS. KLEER: I guess the only --

MADAM CHAIR: Just the Ontario Forestry Research or as well the federal government's Forestry Canada Institute?

MS. KLEER: I think I would restrict it to the Ontario Forestry Research Institute.

MS. CRONK: If that's possible for Dean Carrow I take no objection.

DEAN CARROW: Yes.

MR. FREIDIN: It may be worthwhile checking the transcript because I think that was the subject matter of some evidence by the Ministry.

And I just advise Ms. Cronk that a lot of this information, the listing of research, may already have been provided, at least as of the date of some Ministry evidence.

MADAM CHAIR: Do you have a fast way of identifying those references, Mr. Freidin?

If you could provide those tomorrow that would be helpful.

MR. FREIDIN: If I can find them, yes. no problem.

MS. KLEER: Along with level of funding, if possible.

MR. FREIDIN: No, I won't supply the level of funding. I will provide you with whatever information or evidence was given on that subject that I can find quickly for tomorrow.

MS. KLEER: Thank you.

Q. All right. I just have a few questions related to planning, the planning process for aerial application of herbicides and insecticides.

Just as a general question and for sake

of clarity, could you identify the differences between the planning processes for aerial application of herbicide versus that for insecticides?

I think specifically I am looking at the -- there appears to be a lack of an open house for herbicide aerial applications as compared to pesticide -- sorry, insecticide aerial applications. Is that a fair summary, that that difference exists between the two planning processes?

MR. STANCLIK: A. There is no such open house with regard to the herbicide program. However, the herbicide program is initially identified at the five-year planning stage and there is information provided in the timber management plan as to which areas may have tending take place in the five-year period and, again, at the annual work schedule level there are project descriptions submitted with the annual work schedule that identify where tending will take place in that particular year.

And once the annual work schedule has been approved, there is a period of time there available for public inspection at which time the public may comment on proposed areas.

Q. But that's only after they have reviewed the annual work schedule, there is no specific

open house?

A. There is no specific open house.

MR. BUNCE: If I might add something there. At the five-year planning stage, when you -- the areas that may require tending are shown on the maps and are available at the open house, which is somewhat different than insecticides because it is very hard to predict where an insect infestation may occur over the five-year period.

So the herbicide -- or actually the total tending package proposal is actually there at the open house stage at the five-year plan.

Q. Would that then explain -- or could someone explain to me then why the difference between the herbicide planning process and the insecticide planning process. Is it the reason that you've indicated or is it something broader than that?

A. I can only give you my estimation of what the reason is, and I think probably one of the reasons is that the insecticides program did not go through and open house because it couldn't be identified at the time and, therefore, the Ministry of Natural Resources has deemed that they will have an open house prior to the insecticide program, but that's only my opinion on it.

Q. Right. That is an MNR decision, so it's something that --

A. Yes.

MR. STANCLIK: A. It's difficult enough to plan five years ahead for herbicides, but we can give you general areas, but as far as insecticides, it is virtually impossible and that's why insecticides would have an open house close to the time of the actual project coming on stream.

Q. Are there instances where the tending areas that are set out on the five-year plan change substantially in the annual work schedule?

MR. BUNCE: A. Again, it's my understanding that if you propose areas under the present system for tending which did not show up in the five-year plan for tending you would require an amendment to the five-year plan, and it would be up to the district manager to determine whether that was significant, as to what type of amendment it would be, whether it would be an administrative minor or a major which would also give an indication of what type of public participation would take place in that regard.

Q. I will ask any one of the people who work on their own management units. If a person who privately holds land identifies during the planning

process, or one of the planning processes with respect to herbicides, that they don't wish to have their lands sprayed with herbicides, is the project manager obliged not to spray on their land?

MR. BUNCE: A. I'm not sure what you are talking about, their own land.

Q. I'm talking about privately held land that includes forest.

A. Okay. The areas that I am responsible for are forest management agreement areas and that is all Crown land. I don't have any responsibility for the private land of an individual and I wouldn't be carrying out a spray program for that individual.

MR. TOMCHICK: A. That's also true of Quebec and Ontario's FMAs. The private land is not included in the FMA.

MR. FERGUSON: A. I believe that's the case with all FMAs, they are Crown land, and the private land as such do not full the jurisdiction of the forest manager for that reason.

Q. If there were private land, as there most likely is or as there may be, adjacent to the Crown land which is sprayed and a person who owned that land adjacent were to indicate that they did not wish

to have their land sprayed or affected by the spray such that they wanted a buffer zone around their area, would the project manager then be o obliged to not spray in that area?

MR. STANCLIK: A. I can only talk for my company, but we have done that on our free hold lands. Whenever we sprayed on free hold lands, we conducted the other land owners who had adjacent properties, we identified that we intended to spray our lands and if they had objection to us spraying right up to our property line, then they should contact us.

In some instances people contacted us and we instituted buffers to ensure that there was no spray coming across on to their property. That would be the the case in our FMA, we would carry out the same type of procedure.

Q. Do any of the others have experience with that kind of action?

MR. FERGUSON: A. Yes. In the case of private land or such things as cottages or whatever, there is a standard buffer zone of 120 metres placed around that particular value.

MR. BUNCE: A. That's standard for all FMAs.

Q. Okay. Is that just policy, internal

policy?

A. No, that's actually as per the buffer zones for -- recommended for aerial application of pesticides in Crown forests in Ontario and I do believe it was an exhibit.

Q. Yes, all right. I am referring to the same document. If a trapper's cabin approved, which I understand to be approved by the Ministry of Natural Resources, although there is no land use permit or any such thing associated with it, were within the FMA area, would the same precaution or would the same buffer zone potential be applied?

Perhaps I can ask you, Mr. Stanclik, are you familiar with that?

MR. STANCLIK: A. The person would be contacted directly and we would request his knowledge of the area and whether he was going to be using the trapper's cabin at the time that we intended to spray. If it was acceptable to him, we would put a minimal buffer around it.

Q. If he were not using it at the time of spraying, would the same practice be done?

A. If he was not using it, we would put a minimal buffer; otherwise we would put the required normal size buffer on it.

Q. Sorry, I'm not sure...

A. The normal size buffer.

Q. The 120 metre?

A. 120 metres, yes.

Q. And when you say minimal buffer, you mean precisely what?

A. Something less than 120 metres.

Q. That's fairly precise.

MR. FERGUSON: A. That be subject to a discussion with the trapper in question and would be a decision, in fact, made by the planning team.

MADAM CHAIR: Excuse me, witnessess, have you ever had an experience where a trapper wouldn't leave a cabin if you wanted to spray or would you spray around?

MR. TOMCHICK: We would leave the 120 metre buffer in place in that case.

MR. SMITH: We've had experience where the gentleman was using his trapper shack as a summer home and we applied the 120 metre buffer.

MS. KLEER: Q. Let me ask another -- or pose another example. If an area was regularly used for subsistence use, berry picking by a native person, regardless of the possible potential positive effects on blueberries, say, would you offer to them the

opportunity of a buffer zone to be put around that berry picking area? Has that happened in your experience?

Perhaps I could ask each of you individually.

MR. STANCLIK: A. We don't normally spray where there are blueberries. In our particular part of the country it would be inconsistent, there are no blueberries where we spray, but normally something like that would be indentified in the planning process and the planning team would make a decision on the value of that non-timber use.

Q. So the same protection would not be given; in other words, there would not be an automatic buffer zone?

A. It would be up to the planning team to decide.

Q. Perhaps I can go to you, Mr. Smith?

MR. SMITH: A. No, I have no recollection of a northern resident approaching Abitibi Woodlands and suggesting that -- or requesting that we would not spray his or her favorite berry picking patch.

We do have blueberry picking areas in relative -- close proximity to Thunder Bay that we have

voluntarily not sprayed. I realize that they are used quite heavily on weekends for family outings and that sort of thing. I would suggest if there was an area that a northern resident was requesting to be incorporated as part of a no spray area, that, as Mr. Stanclik had indicated, would be incorporated into the timber management plan at that level.

Q. Mr. Bunce?

MR. BUNCE: A. I think if you are talking about this as a value at the five-year plan stage, as was stated, it would be looked at by the planning team and I think it would probably also -- you would have to look at the factors such as are there many other berry picking areas right around that area, is that berry picking area used every year, could the people who pick the berries there pick them somewhere else for one year.

I think those are the factors and things that would be looked at prior to the planning team deciding whether tending would take place in that area or not at the time.

So I think if it is described as a value at the planning stage that would be the case. I think if it was not at the planning stage, if it was identified at any time, then I think the same process

would have to be gone through to look at what significance that value had and what impact of the spraying would be there.

Q. I take it there are no set criteria by which you would decide that a berry picking area were significant or non-significant?

A. No, and I do not think that there is any set criteria for, buffer zones around berry picking areas, at least I'm not aware of any.

Q. All right. I agree with you, although it's not my point to give evidence.

Mr. Ferguson?

MR. FERGUSON: A. Just as I indicated earlier, it's been my experience that the areas that are in need of release, these areas are not significantly viable to warrant picking at the time, however, if such a situation did arise - and I don't recall having done so to date - there is an opportunity for any resident to make known a value such as a preferred berry area at the timber management plan level, at the five-year level, and that value would certainly be considered and addressed by -- considered it would be evaluated, some of other things such as Mr. Bunce has put forth, that the proximity of other berry areas might be considered.

If there was only one it would certainly warrant more protection than if there were several. It would be considered and a prescription made by the planning committee.

MR. TOMCHICK: A. I am not aware of any instances on our FMAs where anybody has come to us and advised us of berry picking spots, however, I would say that that is precisely the kind of information that you need in order to make decisions on tending, placement of buffer zones, et cetera.

Q. Let me pose then a general question. In your opinion -- and Mr. Stanclik, is it?

MR. STANCLIK: A. Mr. Stanclik.

Q. Mr. Stanclik, as a hypothetical, if land were used on a regular basis yearly by native people for subsistence berry picking, would that in your opinion warrant placing a buffer zone around that area if you were to be spraying with aerial herbicides?

A. In my opinion it would warrant that type of treatment, but again it would be up to the planning team to decide.

Q. Perhaps I can ask each of you that same question. Mr. Smith?

MR. SMITH: A. I'm in agreement with Mr. Stanclik on that particular issue. I also agree that

it's something that would have to be incorporated into the planning team action and negotiated.

Q. Mr. Bunce?

MR. BUNCE: A. I would agree with all the several small areas and that is -- are we talking about an entire FMA that people pick blueberries on, or are we talking about specific areas?

Q. The specific area to which they go?

A. If we're talking about specific areas, then if it's definitely a value it certainly would have to be considered and I think there probably would be a buffer zone around the area.

Q. Mr. Ferguson?

MR. FERGUSON: A. I would suggest that if such an area were identified a buffer should be considered, however, having been a blueberry picker all my life I guess, I'm well aware that the blueberry crops change from year to year, area to area, and a particular blueberry spot that is good in one year may be virtually barren in the next, and it may be difficult and you may be protecting an area for no reason.

I would suggest that items such as that would have to be considered before buffers were arbitrarily placed.

Q. Excuse me, for one moment.

And finally, Mr. Tomchick?

MR. TOMCHIK: A. Yes. I would agree with Mr. Ferguson, that if such an area was identified we would certainly consider it in the planning process and its relative value would be assessed, and if buffer zones were deemed necessary by the planning team, they would certainly be imposed.

Q. I was giving a specific example of where a native person, or rather an native community used a particular area year to year for picking of berries, what then would be your opinion?

In your opinion, would you recommended that a buffer zone --

A. Well, in my personal opinion I would work with the Ministry of Natural Resources and the native community to establish whether or not that particular year that particular area was going to be used, and if it was going to be used, we would certainly consider a buffer zone.

Q. Thank you.

MS. KLEER: I have one small question yet which is just another little matter that I wanted to deal with, and then I would have a whole block of information or block of questions that I would like to

ask tomorrow, so hopefully it will just take about 10 minutes, and bring us up to five.

MADAM CHAIR: That's fine, Ms. Kleer.

MS. KLEER: Q. There was a report by Malik and Vanden Born that was referred to at page 90 of the witness statement which I'd like to ask just one question about.

I have a copy of just one page of that report which I think stands on its own, so I'll just distribute that at this point. (handed)

MADAM CHAIR: Thank you. You'd like to make this an exhibit?

MS. KLEER: Yes.

MADAM CHAIR: That will be Exhibit 1203.

---EXHIBIT NO. 1203: One-page excerpt of report by Malik and Vanden Born referred to at page 90 of OFIA/OLMA Panel No. 7 statement of evidence.

MS. KLEER: Q. Now, at page 3 in the second column --

MS. CRONK: Sorry, can you give the panel one?

MS. KLEER: Sorry, I apologize. Do we have one for the panel?

DR. McCORMACK: We have one copy here.

MS. KLEER: You have just one copy.

DEAN CARROW: Two.

MS. KLEER: Q. Who was responsible for the evidence on page 90, any particular person or everybody?

DR. McCORMACK: A. I think I should probably first address that question depending on the nature of the question.

Q. All right. Well, at page 3, the first paragraph -- not the first full paragraph, but just the first paragraph, it states at the last sentence:

> "Despite the drawbacks of manual weeding it may be the best method to use in areas which are in close proximity to northern communities and in areas which may be particularly environmentally sensitive."

Just focussing for the moment on the first point, "...for areas which are in close proximity to northern communities", would you agree that that may be the best method to use; i.e., manual weeding as opposed to aerial application of herbicides?

A. Just now hearing your question, it would be appropriate to--

Q. Refer it to someone else.

A. --hear from those members of the panel who are responsible for...

MR. STANCLIK: A. From a technical standpoint I would say the aerial application of herbicides can be just as safe as manual weeding. There would be a buffer established to ensure the area that was intended to be sprayed would receive the treatment.

Under certain circumstances there would -- site-specific, there could be a reason for doing it manually rather than aerially.

Q. Would you be able to think of such a situation from your own experience?

A. I don't have any background to compare with.

Q. Does any of the other panel members have any particular experience with close to native communities and what they do with herbicides?

MR. BUNCE: A. I don't have native community on any of the three FMAs that I have. I believe there is a reserve touching one of the FMAs in Mount Batten Township, however, I understand that Mount Batten Township the natives there, there is no community, the community was moved in the early 70s to Chapleau proper or the vicinity of Chapleau, but it is

not part of the FMA, it's in one of the townships.

Q. Mr. Tomchik, is that one of your FMAs, or...

MR. TOMCHIK: A. No, it isn't, and there are no -- the closest reserve to our FMAs I think is seven miles.

MR. STANCLIK: A. Ms. Kleer, it's true in my case, the closest reserve is about six miles.

Q. Is there anyone -- Mr. Ferguson?

MR. FERGUSON: A. There are no native communities or reserves in the vicinity of the English River Forest.

Q. That's right, I didn't find one. The same is true for you, Mr. Smith?

MR. SMITH: A. Similar situation.

Q. Okay. So if anyone were to give an answer it would be purely on the basis of hypothesis?

MR. STANCLIK: A. True.

MS. KLEER: Well, that ends my questioning on that brief excerpt and the rest of it will be starting a whole new chunk of questions, so I would suggest to end now, if we may.

MADAM CHAIR: All right. And how long do you think you will be tomorrow, Ms. Kleer?

MS. KLEER: Well, I hope I will be not

much longer than half a day.

MADAM CHAIR: And will you be prepared to follow Ms. Kleer, Mr. Freidin?

MR. FREIDIN: Yes, yes I will.

And perhaps before we adjourn, I have a tentative list of documents that might be useful for the witnesses to have.

MS. CRONK: Just before Mr. Freidin does that, Madam Chair, I was going to ask Ms. Kleer to do the same thing. If I could have a list of what exhibits she proposes to refer to tomorrow, I'll try to see that the witnesses have it and I have it.

MS. KLEER: Yes, Ms. Cronk.

MADAM CHAIR: Would you like to read your list off now, Mr. Freidin?

MR. FREIDIN: Yes, and I can't guarantee I will ask on all these, but it's the OFIA terms and conditions, Exhibit 1133; MNR's terms and conditions, Exhibit 700; Exhibits 641, 662, which are guidelines regarding the aerial application of herbicides; 604A which is Volume 1 of MNR's Panel 13 witness statement; Exhibit 1136 - we've already got that - Volume 113 of the transcripts; and I will provide a copy of one page of the Panel 8 witness statement from MNR so no one needs to get it. I will provide that copy tomorrow.

MADAM CHAIR: Thank you, Mr. Freidin. Could you give me the numbers above 662?

MR. FREIDIN: Above 662? 641, and the two before that were 1133 and 700, those are OFIA terms and conditions and MNR's terms and conditions respectively.

MADAM CHAIR: Thank you.

Ms. Kleer?

MS. KLEER: I have almost got it all written down. Exhibit 1136, which is part of this panel; I will be introducing MNR Question No. 9, Question and Answer No. 9 on this panel; I will also introduce the Forest Pest Control Form Annual Reports for the years 1981 to '84.

A summary was sent to you earlier, Ms. Cronk which I will also be introducing, that was some time ago, if you like I can --

MS. CRONK: I didn't receive it, that's why I'm asking.

MS. KLEER: You didn't receive that?

MS. CRONK: No, that's why I'm asking you for it.

MS. KLEER: Well, the exhibit was sent to you. I'll clarify with you that particular exhibit.

MS. CRONK: Fine.

MADAM CHAIR: Could you speak up, Ms. Kleer, please.

MS. KLEER: Pardon me. I'm just running through. Exhibit 632.

MR. FREIDIN: What is that?

MS. KLEER: What is that? Actually I'll only be referring to one specific part of that Panel 13, Interrogatories by OFIA/OLMA and specifically Question 8. I will be introducing two papers which I have sent you, or which you just received, an excerpt from a document called: Microbial Insecticides in Canada, and Exhibit 635.

MR. FREIDIN: Which is...?

MS. KLEER: That is the first statement by the Minister of Natural Resources, May, '85 with respect to no chemicals policy. And that's it.

MS. CRONK: Thank you.

MADAM CHAIR: Thank you very much. We will adjourn until 8:30 tomorrow morning.

---Whereupon the hearing adjourned at 5:05 p.m., to be reconvened on Thursday, May 31st, 1990, commencing at 8:30 a.m.